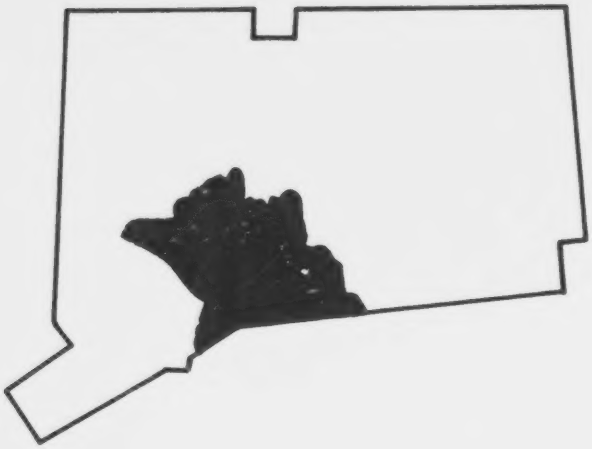
FLOOD INSURANCE STUDY

TOWN OF OXFORD, CONNECTICUT
NEW HAVEN COUNTY



REVISED
MARCH 18, 1991

Federal Emergency Management Agency

COMMUNITY NUMBER - 090150

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Flood Insurance Study Effective Date: June 1979 (Flood Insurance Rate Map dated December 4, 1979)

Flood Insurance Study Revised: March 18, 1991

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PUBLISHED SEPARATELY:

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Flood Insurance Rate Map

FLOOD INSURANCE STUDY
TOWN OF OXFORD, CONNECTICUT

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates a previous Flood Insurance Study/Flood Insurance Rate Map for the Town of Oxford, New Haven County, Connecticut. This information will be used by the town to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the original study were performed by Harris-Toups Associates, for the Federal Emergency Management Agency (FEMA), under Contract No. H-3987. The hydrologic and hydraulic analyses in this updated study were performed by FGA Services, Inc., for FEMA under Contract No. EMW-87-C-2447. The work for this study was completed in March 1988.

1.3 Coordination

On October 29, 1986, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA, FGA Services Inc. (the study contractor), and the town to determine the streams to be studied by detailed methods. During the course of the study the hydraulic analyses for the Housatonic River were coordinated with the New England Division of the U. S. Army Corps of Engineers (COE) and the State of Connecticut Department of Environmental Protection. Northeast Utilities was contacted for information regarding hydropower dams.

On March 22, 1990, a final CCO meeting was held with representatives of FEMA, the study contractor, and the town to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Town of Oxford, New Haven County, Connecticut. The area of study is shown on the Vicinity Map (Figure 1).

The following flooding sources were studied by detailed methods:

Stream	Limits of Detailed Study
Housatonic River	For its entire length within the community
Lake Zoar	For its entire shoreline within the community
Fivemile Brook	From its confluence with the Housatonic River to a point approximately 1,600 feet upstream of East Hill Road
Eightmile Brook	From its confluence with the Housatonic River to a point approximately 0.42 mile upstream of Loughlin Road
Little River	From the downstream corporate limits to a point approximately 1,625 feet upstream of Christian Street
Riggs Street Brook	From its confluence with the Little River to a point approximately 1.16 miles upstream of Riggs Street

In this updated study, the Housatonic River was restudied and Lake Zoar was added to the flooding sources studied by detailed methods. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through March 1993.

All or portions of the following streams were studied by approximate methods: the Little River, Riggs Street Brook, Fourmile Brook, Sixmile Brook, Sevenmile Brook, Fivemile Brook, Eightmile Brook, Swan Lake Brook, Towantic Brook, Long Meadow Pond Brook, Jacks Brook, Reservoirs Number 2, 3 and 4, Towantic Pond, Chanko Pond, Papermill Pond and 55 unnamed tributaries. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the town of Oxford.

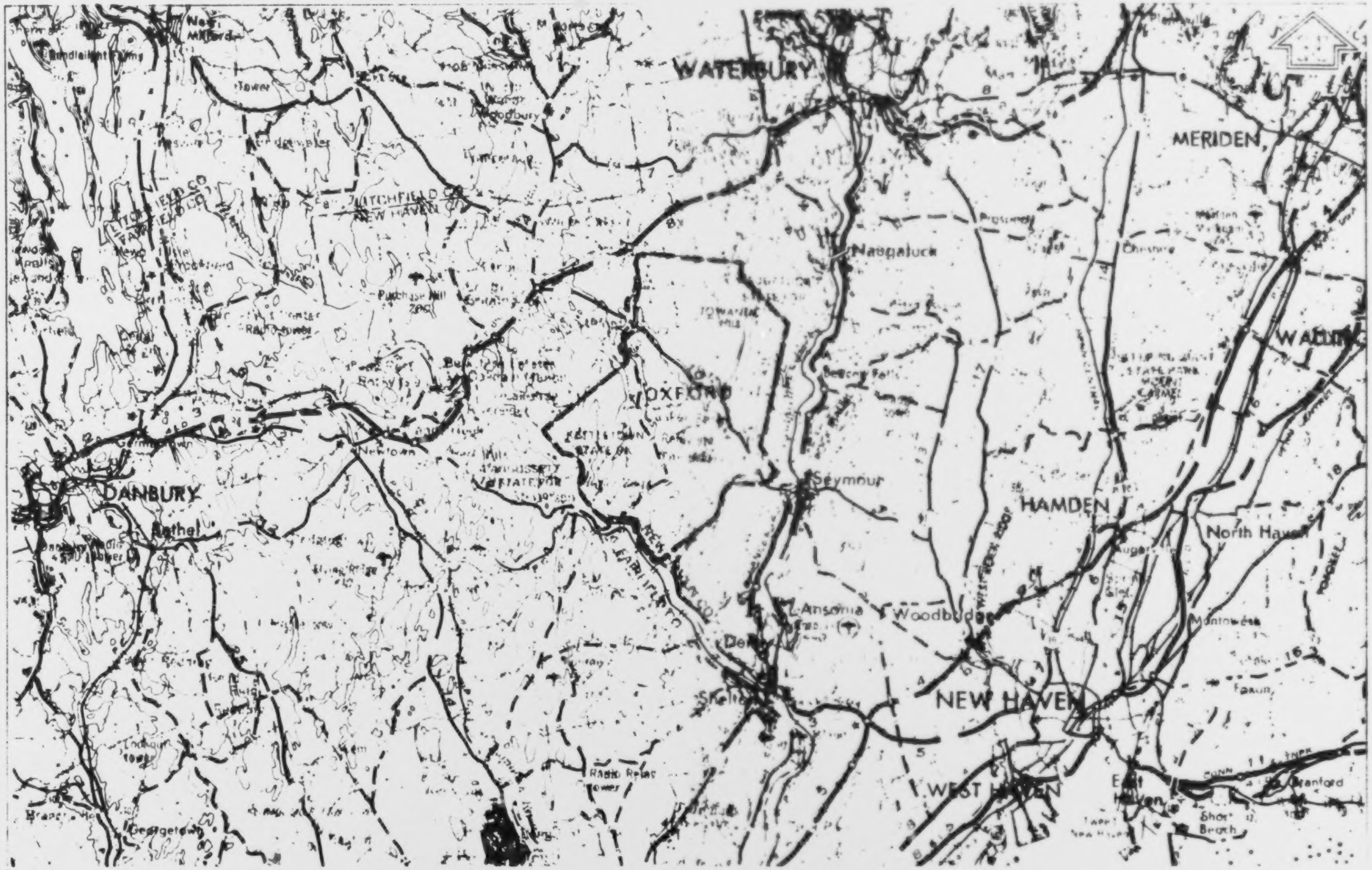

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

(NEW HAVEN CO.)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

2.2 Community Description

The Town of Oxford is located in the southwestern portion of New Haven County, in southwestern Connecticut, 18 miles north of Bridgeport and 16 miles northwest of New Haven. It is bordered to the north by the Town of Middlebury, to the east by the Borough of Naugatuck and the Town of Beacon Falls; to the south by the Towns of Seymour and Monroe and the City of Shelton; and to the west by the Towns of Newtown and Southbury. The total area encompassed by the Town of Oxford is 33.0 square miles, and the 1978 population was estimated at 5,800.

The chief industries of the Town of Oxford are dairy and chicken farming (Reference 1). The town is also expanding as a regional suburb in which a large part of the population work in the nearby cities of Bridgeport, Waterbury, and New Haven. The Town of Oxford is served by State Routes 34, 188, and 67, which connect with the major state highway network. Some light commercial and industrial development exists along State Route 67; however, since the major highways are located outside the town, it remains predominantly residential.

A variable climate prevails in the area, with frequent periods of heavy precipitation produced by local thunderstorms and larger weather systems of tropical and extratropical origin (Reference 2). The mean annual temperature of the drainage basin is approximately 47°F, and the annual precipitation averages 46 inches.

The major river in the area is the Housatonic River, which forms the southwestern corporate limits of the Town of Oxford with the City of Shelton and the Towns of Monroe and Newtown. Along its course through the Town of Oxford, the Housatonic River intercepts the tributary flows of Fivemile Brook and Eightmile Brook.

The Little River and its tributary, Riggs Street Brook, flow southeast from their source in the north-central hills of the Town of Oxford to the southeastern corporate limits with the Town of Seymour, where the Little River continues on to its confluence with the Naugatuck River.

Eightmile Brook is a tributary of the Housatonic River and forms a portion of the corporate limits of the Town of Oxford with the Town of Southbury. It continues south through the Town of Oxford until it reaches its confluence with the Housatonic River just below the Stevenson Dam. Fivemile Brook is another small tributary of the Housatonic River, flowing west from its source in the south-central hills of the Town of Oxford to its confluence just downstream of Stevenson Dam and Eightmile Brook.

The majority of the land consists of moderately-drained upland soils with a slowly permeable substrata. Other areas of town have shallow bedrock soils, and scattered swamps comprise the most poorly-drained soils.

The topography of the Town of Oxford is moderate to steeply sloping and very rugged in some areas. The relief of the community ranges from an elevation of 40 feet on the Housatonic River below Stevenson Dam to 770 feet at Towantic Hill.

2.3 Principal Flood Problems

Flooding on the Housatonic River can occur during any season as a result of intense rainfall, particularly during the coastal storm and hurricane season from May to October. The probability of major flooding is also increased during the period of December through April due to the combination of precipitation and increased runoff from frozen ground and snowmelt.

Six major floods have occurred since 1900: in 1927, 1936, 1938, 1948, and two in 1955. The most severe flood took place in October 1955 on the Housatonic River and had an estimated recurrence interval of 120 years.

Some flooding can occur on the Housatonic River near the corporate limits with the Town of Seymour and further upstream at its confluence with Eightmile Brook and Fivemile Brook.

Flooding has also been prevalent on portions of the Little River and its tributary, Riggs Street Brook. The Little River has experienced flooding problems at Hogs Back Road and at its confluence with Towantic Brook in the south portion of the town near the State Route 67 crossing, extending to Park Road. Additional flooding has occurred at the Riggs Street Brook crossing of State Highway 67 near its confluence with the Little River. Flooding has also occurred on Riggs Street Brook upstream of the school access road.

2.4 Flood Protection Measures

There are no known flood protection measures within the Town of Oxford.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency and peak elevation-frequency relationships for each flooding source studied in detail affecting the community.

Peak discharge-frequency relationships for the Little River were based on gaging records recorded by the USGS at gaging station No. 1208700, located on the Little River within the corporate limits. This gage has a recording period extending from 1961 to the present. A log-Person Type III distribution of the annual peak flows at the gage was calculated and then applied to various drainage areas on the Little River throughout the town (Reference 3).

Riggs Street Brook, Eightmile Brook, and Fivemile Brook do not have stream gages which can be used to develop frequency discharge relationships, so USGS floodflow formulas were used (Reference 4). The formulas, developed in 1975, evolved from a log-Pearson Type III regression analysis performed on 107 stream gaging stations throughout Connecticut (Reference 3). These gaging stations have a mean record length of 34 years, supplemented by almost 200 years of historic records. The resultant statistical parameters for use in the floodflow equations, skew and standard deviations, were computed at each gaging station and plotted on an isopleth map. From these maps, values of skew and standard deviation can be selected for any stream located in Connecticut. Other parameters taken into account by these floodflow formulas are localized stream length and slope, urbanization, and rainfall intensity. These empirically-developed equations were adopted with the approval of the FIA.

Floodflow frequencies for the Housatonic River were obtained by statistical analyses performed by the U. S. Army Corps of Engineers of the stage-discharge records at the U. S. Geological Survey (USGS) gaging station located at Stevenson, Connecticut, 0.2 mile downstream of the Stevenson Dam. The period of record at the station is from 1928 to the present. The analysis was based on a log-Person Type III distribution as prescribed by the U. S. Water Resources Council (Reference 3).

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs)			
		10-YEAR	50-YEAR	100-YEAR	500-YEAR
HOUSATONIC RIVER					
Below confluence of Eight Mile Brook	1,559.0	45,000	90,000	130,000	198,000
At Stevenson gaging station	1,541.0	42,000	87,000	126,000	196,000
FIVEMILE BROOK					
At Confluence with the Housatonic River	1.94	408	738	923	1,492
Approximately 1,600 feet upstream of East Hill Road	1.59	327	591	741	1,195
EIGHTMILE BROOK					
At confluence with Housatonic River	17.5	1,505	2,718	3,402	5,498
0.42 mile upstream of Loughlin Road	17.3	1,487	2,682	3,354	5,390
LITTLE RIVER					
At Seymour corporate limits	15.12	1,340	2,330	2,860	4,430
Above confluence of Towantic Brook	7.78	760	1,400	1,725	2,750
Above confluence of Riggs Street Brook	4.54	496	918	1,160	1,880
Below Towner Lane	1.15	216	400	508	847
Above State Bridle Trail	0.80	172	320	408	675
1,620 feet upstream of Christian Street	0.04	28	51	66	110
RIGGS STREET BROOK					
At confluence with Little River	2.80	272	505	640	1,068
Above confluence of Jacks Brook	0.86	196	300	356	512
1.16 miles upstream of Riggs Street	0.32	155	200	223	282

Pool elevations for Lake Zoar were based on data from a stage-storage volume and outflow capacity table contained in the license for Housatonic River Project No. 2576 and from the discharge curves developed for the Stevenson Dam and illustrated in the federal licensing drawings (References 5 and 6).

The stillwater elevations for the 10-, 50-, 100-, 500-year floods have been determined for Lake Zoar and are summarized in Table 2, "Summary of Stillwater Elevations."

TABLE 2 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
LAKE ZOAR Entire shoreline within the community	101.0	106.0	109.2	116.0

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

The cross sections used in the backwater analyses of streams studied by detailed methods were determined by a field survey performed in 1977 and topographic maps made from strip aerial photographs at a scale of 1:2,400 taken in April 1977 (Reference 7).

The cross sections used in the backwater analyses of the Housatonic River and Lake Zoar were determined by a field survey in 1987. Cross sections were located at close intervals above and below bridges and dams in order to compute the significant backwater effect of these structures. When available, bridge plans were used to obtain elevation data and structural geometry; all bridges and culverts for which plans were unavailable or out-of-date were surveyed. In addition, cross sections were taken between hydraulic controls whenever warranted by topographic changes.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 8). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Starting water-surface elevations for the Housatonic River and Little River profiles were based on water-surface profiles which were developed during the preparation of the Flood Insurance Study for the Town of Seymour (Reference 9). The starting water-surface elevations for the tributary streams were taken from the initially determined mainstream profiles at the points of confluence.

Channel roughness factors (Manning's "n") used in the hydraulic computations were assigned on the basis of field inspection of channel and overbank areas, photographs, and any previous reports or findings dealing with hydraulically similar streams. For the streams studied by detailed methods in the original study, channel "n" values ranged from 0.025 to 0.040, and overbank "n" values ranged from 0.040 to 0.100. For the flooding sources studied or restudied by detailed methods in this updated study, channel "n" values ranged from 0.040 to 0.050, and overbank "n" values ranged from 0.060 to 0.070.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing floodplain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the flooding sources studied in detail, the 100- and 500-year floodplain boundaries have been delineated using topographic maps (References 7 and 10).

For the streams studied by approximate methods, the boundaries of the 100-year floodplain were delineated using the previously published Flood Insurance Study for the Town of Oxford (Reference 11).

The 100- and 500-year floodplain boundaries are shown on the Flood Boundary and Floodway Map (Exhibit 2). In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the floodplain. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 3).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary has been shown. Portions of the floodway widths for the Housatonic River extend beyond the corporate limits.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

Floodwaters from the following streams were found to have hazardous velocities: the Housatonic River, Fivemile Brook, Eightmile Brook, the Little River, and Riggs Street Brook. Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. To provide guidance for encroachment into these areas, a proposed floodway is delineated for that part of the 100-year floodplain that conveys flow.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Housatonic River								
A	5,160	644/ 500	1,548	8.4	50.0	50.0	51.0	1.0
B	7,520	436/ 140	1,189	10.9	53.5	53.5	54.2	0.7
C	8,960	310/ 220	8,600	15.1	55.8	55.8	56.5	0.7

[1] Feet above corporate limits

[2] Width/width within corporate limits

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

(NEW HAVEN CO.)

FLOODWAY DATA

HOUSATONIC RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Fivemile Brook								
A	136	75	214	4.3	53.2	41.1[2]	41.1	0.0
B	590	22	77	10.6	56.5	56.5	56.5	0.0
C	700	23	78	10.5	60.7	60.7	60.7	0.0
D	814	24	101	8.1	66.4	66.4	66.4	0.0
E	1,040	30	85	9.7	73.0	73.0	73.0	0.0
F	1,158	12	63	13.0	78.2	78.2	78.2	0.0
G	1,900	37	85	8.7	114.6	114.6	114.6	0.0
H	2,610	25	75	9.9	165.5	165.5	165.5	0.0
Eightmile Brook								
A	132	84	572	5.9	55.0	44.0[2]	44.0	0.0
B	1,270	75	314	10.8	60.3	60.3	61.3	1.0
C	2,140	62	280	12.2	78.3	78.3	78.3	0.0
D	2,265	49	259	13.1	80.9	80.9	80.9	0.0
E	3,240	57	271	12.5	99.9	99.9	99.9	0.0
F	4,585	37	233	14.4	136.7	136.7	137.5	0.8

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[1] Feet above confluence with Housatonic River

[2] Water-surface elevations determined without consideration of backwater effects from Housatonic River

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

(NEW HAVEN CO.)

FLOODWAY DATA

FIVEMILE BROOK - EIGHTMILE BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
Riggs Street Brook (Continued)								
T	6,970	20	112	2.9	568.2	568.2	568.2	0.0
U	7,550	21	40	7.9	588.6	588.6	588.6	0.0
V	7,690	24	114	2.8	597.5	597.5	597.5	0.0
W	7,925	156	667	0.5	597.5	597.5	597.5	0.0
X	8,260	12	33	9.6	601.4	601.4	601.4	0.0
Y	8,367	53	176	1.8	603.4	603.4	603.5	0.1
Z	8,950	18	43	7.4	603.7	603.7	604.7	1.0
AA	9,053	95	466	0.7	607.3	607.3	607.3	0.0
AB	9,665	72	304	0.7	607.4	607.4	607.4	0.0
AC	10,160	54	164	1.4	607.4	607.4	607.4	0.0

[1] Feet Above Mouth

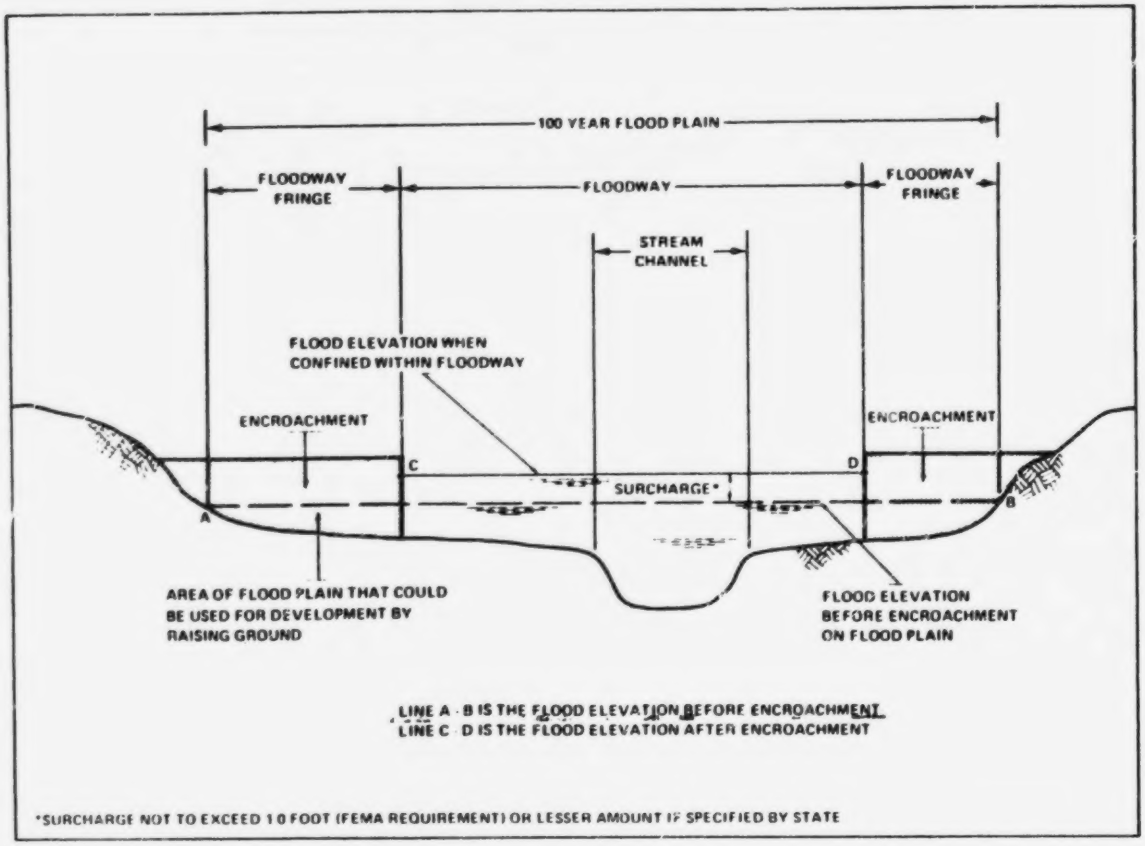
TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

FLOODWAY DATA

RIGGS STREET BROOK


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FLOODWAY SCHEMATIC Figure 2

5.0 INSURANCE APPLICATION

To establish actuarial insurance rates, data from the engineering study must be transformed into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source studied in detail in the Town of Oxford.

5.1 Reach Determinations

Reaches are defined as sections of floodplain that have relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference may not have a variation greater than that indicated in the following tabulation for more than 20 percent of the reach:

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of the Town of Oxford is shown on the Flood Profiles (Exhibit 1) and summarized in Table 4.

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is used to establish relationships between depth and frequency of flooding in any reach. This relationship is then used with depth-damage relationships for various classes of structures to establish actuarial insurance rate tables.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations rounded to the nearest one- half foot, multiplied by 10, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year flood water-surface elevations is greater than 10.0 feet, it is rounded to the nearest whole foot.

5.3 Flood Insurance Zones

Flood insurance zones and zone numbers are assigned based on the type of flood hazard and the FHF, respectively. A unique zone number is associated with each possible FHF, and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 or greater.

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zones A2, A3, A4, A5, A9, A16 A20, A21 and A22:	Special Flood Hazard Areas inundated by the 100-year flood; with base flood elevations shown, and zones subdivided according to FHFs.
Zone B:	Areas between the Special Flood Hazard Areas and the limits of the 500-year flood; areas that are protected from the 100- or 500-year floods by dike, levee, or other water control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Housatonic River							
Reach 1	0016	-11.4	-4.4	5.7	110	A21	Varies - See Map
Fivemile Brook							
Reach 1	0016,0013	- 2.4	-1.1	2.3	025	A5	Varies - See Map
Eightmile Brook							
Reach 1	0016	-10.0	-3.1	5.0	100	A20	Varies - See Map
Reach 2	0016,0013	- 2.5	-0.8	1.8	025	A5	Varies - See Map
Little River							
Reach 1	0014,0012 0011,0004 0003	- 2.1	-0.7	1.6	020	A4	Varies - See Map
Reach 2	0003,0001	- 4.5	02.6	0.9	045	A9	Varies - See Map
Riggs Street Brook							
Reach 1	0012	- 1.8	-0.2	0.4	020	A4	Varies - See Map
Reach 2	0012	- 1.6	-0.5	1.8	015	A3	Varies - See Map
Reach 3	0012,0004	- 2.4	-0.6	0.7	025	A5	Varies - See Map
Reach 4	0012,0004	- 1.3	-0.3	0.8	015	A3	Varies - See Map
Reach 5	0004	- 0.8	-0.3	0.4	010	A2	Varies - See Map

[1] Flood Insurance Rate Map Panel [2] Weighted Average [3] Rounded to Nearest Foot

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

FLOOD INSURANCE ZONE DATA

HOUSATONIC RIVER-FIVEMILE BROOK-EIGHTMILE BROOK-
LITTLE RIVER-RIGGS STREET BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
Little River								
A	4,670	235	2,948	1.0	165.3	165.3	165.3	0.0
B	4,800	172	1,506	1.9	165.3	165.3	165.3	0.0
C	5,985	126	712	4.0	165.3	165.3	165.3	0.0
D	6,950	133	767	3.7	166.8	166.8	167.4	0.6
E	7,590	47	227	12.6	169.3	169.3	169.3	0.0
F	7,721	300	2,155	1.3	174.9	174.9	174.9	0.0
G	8,500	400	943	3.0	175.1	175.1	175.1	0.0
H	9,337	40	216	13.2	181.7	181.7	182.1	0.4
I	9,930	71	313	8.3	186.5	186.5	187.5	1.0
J	10,049	114	883	2.9	192.9	192.9	192.9	0.0
K	10,413	195	860	3.0	201.8	201.8	201.8	0.0
L	10,985	71	269	9.7	202.0	202.0	202.0	0.0
M	11,895	50	218	11.9	223.9	223.9	223.9	0.0
N	12,850	69	242	10.7	237.0	237.0	237.0	0.0
O	13,475	46	212	12.3	242.7	242.7	242.7	0.0
P	13,592	105	670	3.9	248.7	248.7	248.7	0.0
Q	14,000	76	281	9.2	248.9	248.9	249.5	0.6
R	14,136	38	198	13.1	251.2	251.2	251.2	0.0
S	14,865	66	278	8.4	257.1	257.1	257.3	0.2
T	14,997	72	356	6.6	259.2	259.2	259.3	0.1
U	15,240	66	226	10.3	260.6	260.6	260.6	0.0
V	15,925	46	198	11.8	272.5	272.5	272.5	0.0
W	16,056	60	215	10.9	278.9	278.9	278.9	0.0
X	16,750	35	181	12.9	289.1	289.1	289.1	0.0
Y	16,865	170	879	2.7	294.3	294.3	294.3	0.0
Z	17,765	37	183	12.7	297.6	297.6	297.6	0.0

[1] Feet Above Mouth

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

FLOODWAY DATA

LITTLE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						(FEET NGVD)		
Little River (Continued)								
AA	18,450	36	234	10.0	303.7	303.7	304.7	1.0
AB	18,554	47	382	6.1	308.6	308.6	308.6	0.0
AC	18,805	35	243	8.5	309.0	309.0	309.1	0.1
AD	19,038	36	168	12.4	310.1	310.1	310.1	0.0
AE	19,147	28	156	13.3	312.1	312.1	312.1	0.0
AF	19,285	30	157	13.2	314.5	314.5	314.5	0.0
AG	19,418	16	128	16.2	317.6	317.6	317.6	0.0
AH	20,005	52	292	5.9	324.3	324.3	325.2	0.9
AI	20,430	56	172	10.0	329.0	329.0	329.0	0.0
AJ	20,553	67	342	5.0	334.4	334.4	334.4	0.0
AK	20,815	35	147	11.8	337.4	337.4	337.4	0.0
AL	20,951	74	221	7.8	339.4	339.4	339.5	0.1
AM	21,340	84	204	8.4	343.1	343.1	343.1	0.0
AN	21,950	89	204	5.7	347.7	347.7	347.8	0.1
AO	22,072	32	133	8.7	348.8	348.8	348.8	0.0
AP	22,175	31	123	9.4	349.3	349.3	349.3	0.0
AQ	22,275	110	361	3.2	351.6	351.6	351.6	0.0
AR	22,402	36	115	10.1	351.8	351.8	351.8	0.0
AS	22,525	23	98	11.8	352.4	352.4	352.4	0.0
AT	22,820	33	115	10.1	355.9	355.9	355.9	0.0
AU	22,938	63	234	5.0	357.9	357.9	357.9	0.0
AV	23,110	31	108	10.7	358.8	358.8	358.8	0.0
AW	23,270	50	261	4.4	364.1	364.1	364.1	0.0
AX	23,870	63	136	8.5	368.9	368.9	368.9	0.0
AY	24,765	35	113	10.3	385.3	385.3	385.6	0.3
AZ	25,315	51	128	9.1	391.7	391.7	391.7	0.0

[1] Feet Above Mouth

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

FLOODWAY DATA

LITTLE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Little River (Continued)								
BA	26,035	47	124	9.4	404.6	404.6	404.6	0.0
BB	26,500	50	123	9.4	412.6	412.6	412.6	0.0
BC	26,635	88	459	2.5	417.1	417.1	417.1	0.0
BD	27,420	37	115	10.1	420.4	420.4	420.4	0.0
BE	28,295	40	201	5.8	425.5	425.5	425.9	0.4
BF	28,411	54	169	6.9	426.3	426.3	426.3	0.0
BG	28,965	39	146	7.9	429.7	429.7	430.4	0.7
BH	29,100	72	371	3.1	433.9	433.9	433.9	0.0
BI	29,845	36	136	6.6	435.0	435.0	435.2	0.2
BJ	30,440	38	162	5.5	437.1	437.1	437.6	0.5
BK	30,575	20	119	7.5	438.3	438.3	438.3	0.0
BL	31,020	43	206	4.4	439.3	439.3	440.1	0.8
BM	31,395	93	152	5.9	440.9	440.9	440.9	0.0
BN	31,520	95	331	2.7	443.3	443.3	443.3	0.0
BO	32,360	50	173	5.2	444.8	444.8	445.0	0.2
BP	33,250	25	95	9.5	450.6	450.6	451.5	0.9
BQ	34,215	120	354	1.7	455.1	455.1	456.1	1.0
BR	34,790	113	96	5.3	457.0	457.0	457.0	0.0
BS	35,795	50	75	6.8	469.4	469.4	469.4	0.0
BT	36,000	45	274	1.9	476.3	476.3	476.3	0.0
BU	36,830	29	68	7.5	483.9	483.9	484.9	1.0
BV	37,720	41	67	7.5	503.2	503.2	503.2	0.0
BW	38,730	30	62	8.2	526.5	526.5	526.5	0.0
BX	39,360	41	69	7.4	533.5	533.5	533.5	0.0
BY	39,630	270	4,817	0.1	559.8	559.8	559.8	0.0
BZ	40,400	59	65	6.3	572.4	572.4	572.4	0.0

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[1] Feet Above Mouth

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

(NEW HAVEN CO.)

FLOODWAY DATA

LITTLE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						(FEET NGVD)		
Little River (Continued)								
CA	41,365	114	122	3.3	589.2	589.2	589.2	0.0
CB	41,535	100	433	0.9	593.2	593.2	593.2	0.0
CC	41,980	105	166	1.4	593.2	593.2	593.2	0.0
CD	42,530	30	45	5.3	597.7	597.7	597.9	0.2
CE	43,070	16	13	5.1	613.5	613.5	613.5	0.0
Riggs Street Brook								
A	145	23	120	5.3	346.0	346.0	347.0	1.0
B	279	79	132	4.8	347.9	347.9	347.9	0.0
C	800	14	64	9.9	350.1	350.1	350.8	0.7
D	1,225	35	73	8.8	358.3	358.3	358.3	0.0
E	1,360	100	190	3.4	362.8	362.8	362.8	0.0
F	1,892	39	76	8.0	372.2	372.2	372.2	0.0
G	2,005	178	348	1.7	381.6	381.6	381.6	0.0
H	2,788	38	74	8.2	398.0	398.0	398.0	0.0
I	3,575	57	69	5.2	431.2	431.2	431.2	0.0
J	3,970	21	43	8.2	464.8	464.8	464.8	0.0
K	4,100	34	140	2.5	476.5	476.5	476.5	0.0
L	4,500	20	42	8.4	489.4	489.4	489.4	0.0
M	4,767	18	41	8.6	506.6	506.6	506.6	0.0
N	4,870	51	236	1.5	514.7	514.7	514.7	0.0
O	5,618	42	54	6.6	534.7	534.7	534.7	0.0
P	6,209	36	59	6.0	543.7	543.7	543.8	0.1
Q	6,300	30	134	2.6	547.7	547.7	547.7	0.0
R	6,443	16	46	7.0	550.2	550.2	550.2	0.0
S	6,870	15	36	8.9	561.8	561.8	561.9	0.1

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[1] Feet Above Mouth

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

FLOODWAY DATA

LITTLE RIVER-RIGGS STREET BROOK

from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C: Areas of minimal flooding; not subdivided.

Flood elevation differences, FHFs, flood insurance zones, and base flood elevations for the flooding sources studied in detail in the community are shown in Table 4.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Town of Oxford is, for insurance purposes, the principal result of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and base flood elevations. Base flood elevation lines show the locations of the expected whole-foot water-surface elevation of the base (100-year) flood. The base flood elevations and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the National Flood Insurance Program.

6.0 OTHER STUDIES

A Flood Insurance Study has been prepared for the City of Shelton (Reference 12). Because it is based on more up-to-date analyses, this study is not in agreement with that study.

A Flood Insurance Study is currently being prepared for the Town of Seymour (Reference 9). The results of that study will be in exact agreement with the results of this study.

Flood Insurance Studies have been prepared for the Towns of Monroe, Newtown, Southbury, Middlebury and Beacon Falls, and for the Borough of Naugatuck (References 13, 14, 15, 16, 17 and 18). The results of this study are in general agreement with the results of those studies.

Because it is based on more up-to-date analyses, this study supersedes the previously published Flood Insurance Study for the Town of Oxford (Reference 9).

7.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, J. W. McCormack Post Office and Courthouse Building, Room 462, Boston, Massachusetts 02109.

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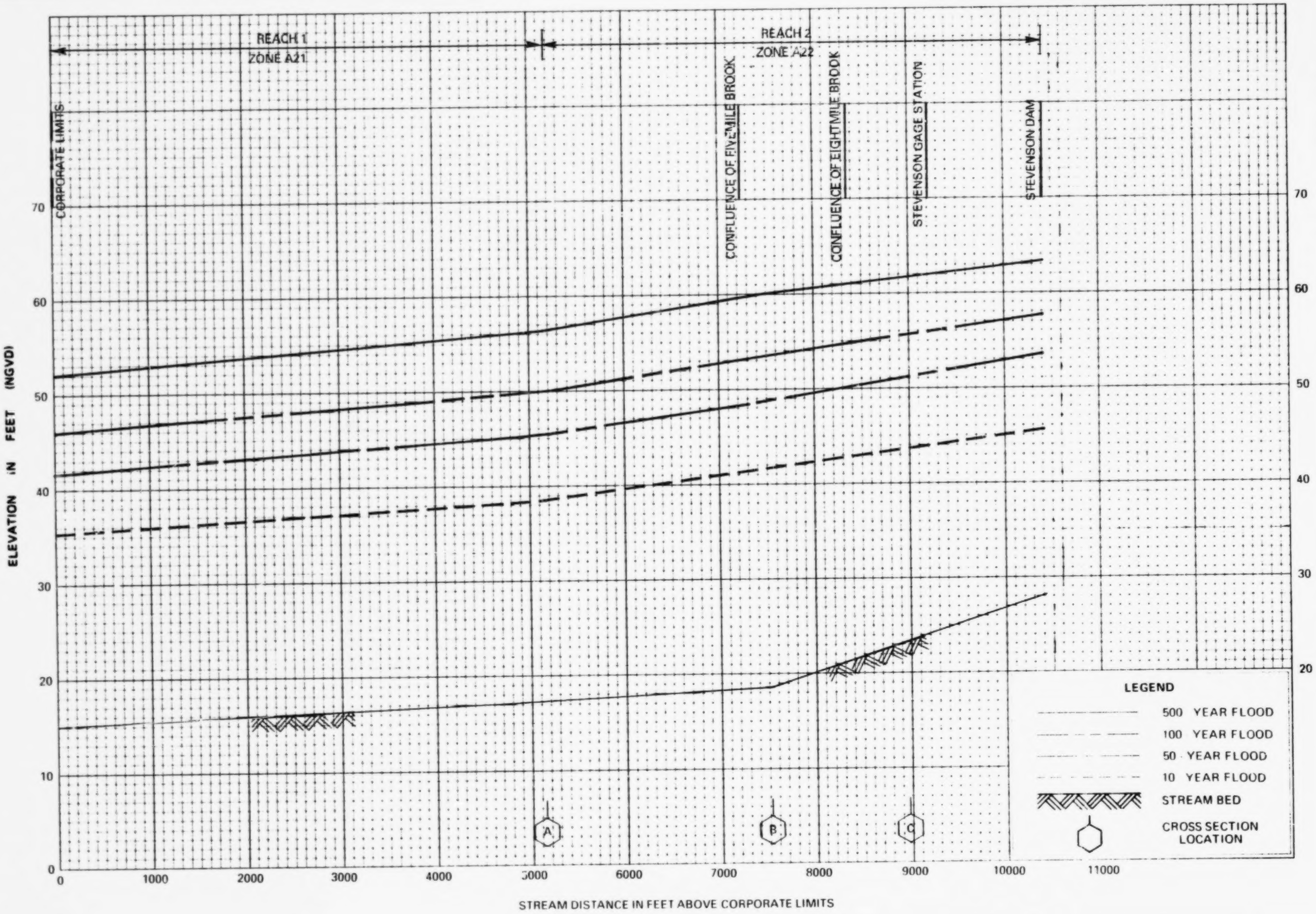


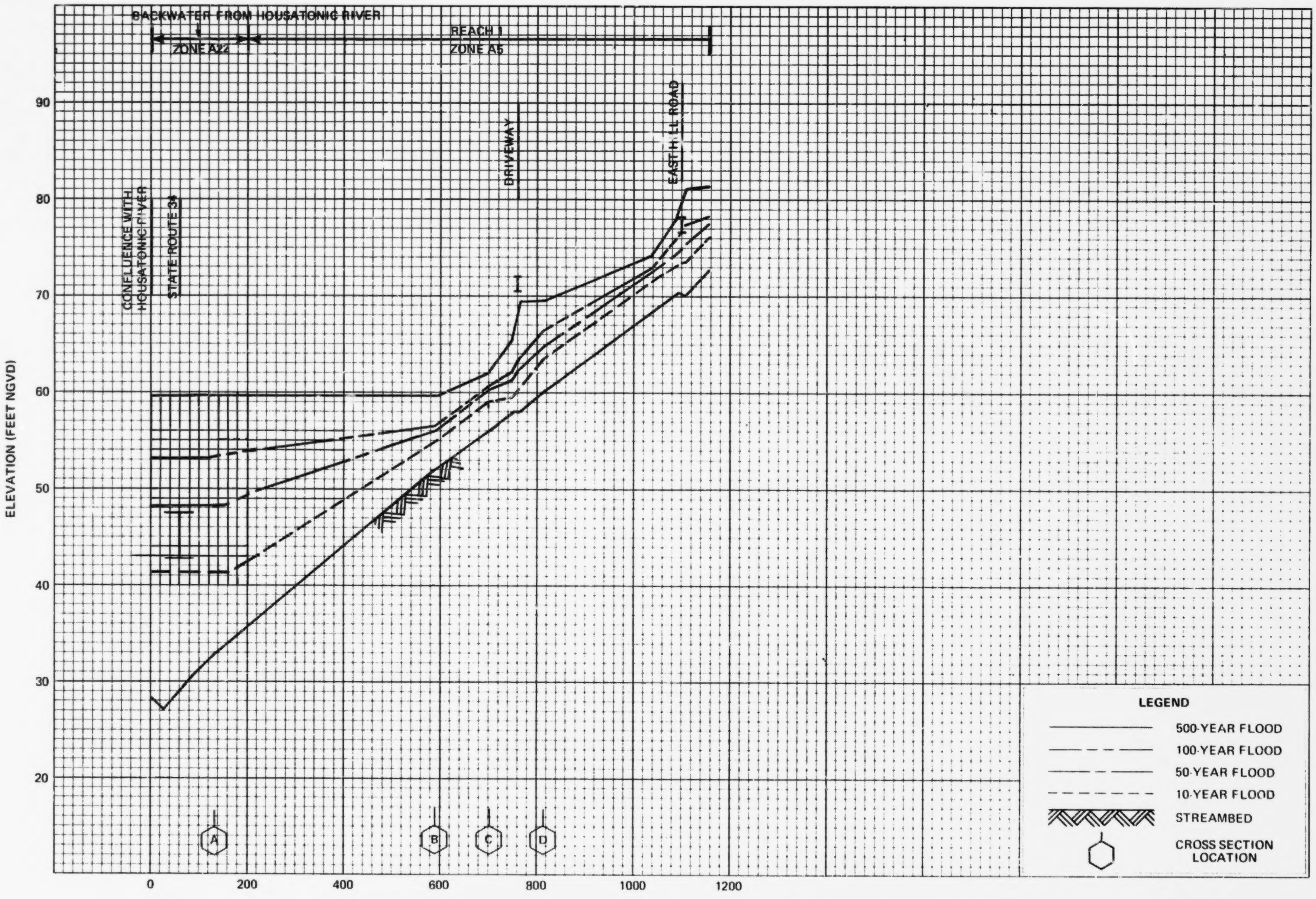
FLOOD PROFILES

HOUSATONIC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

01P



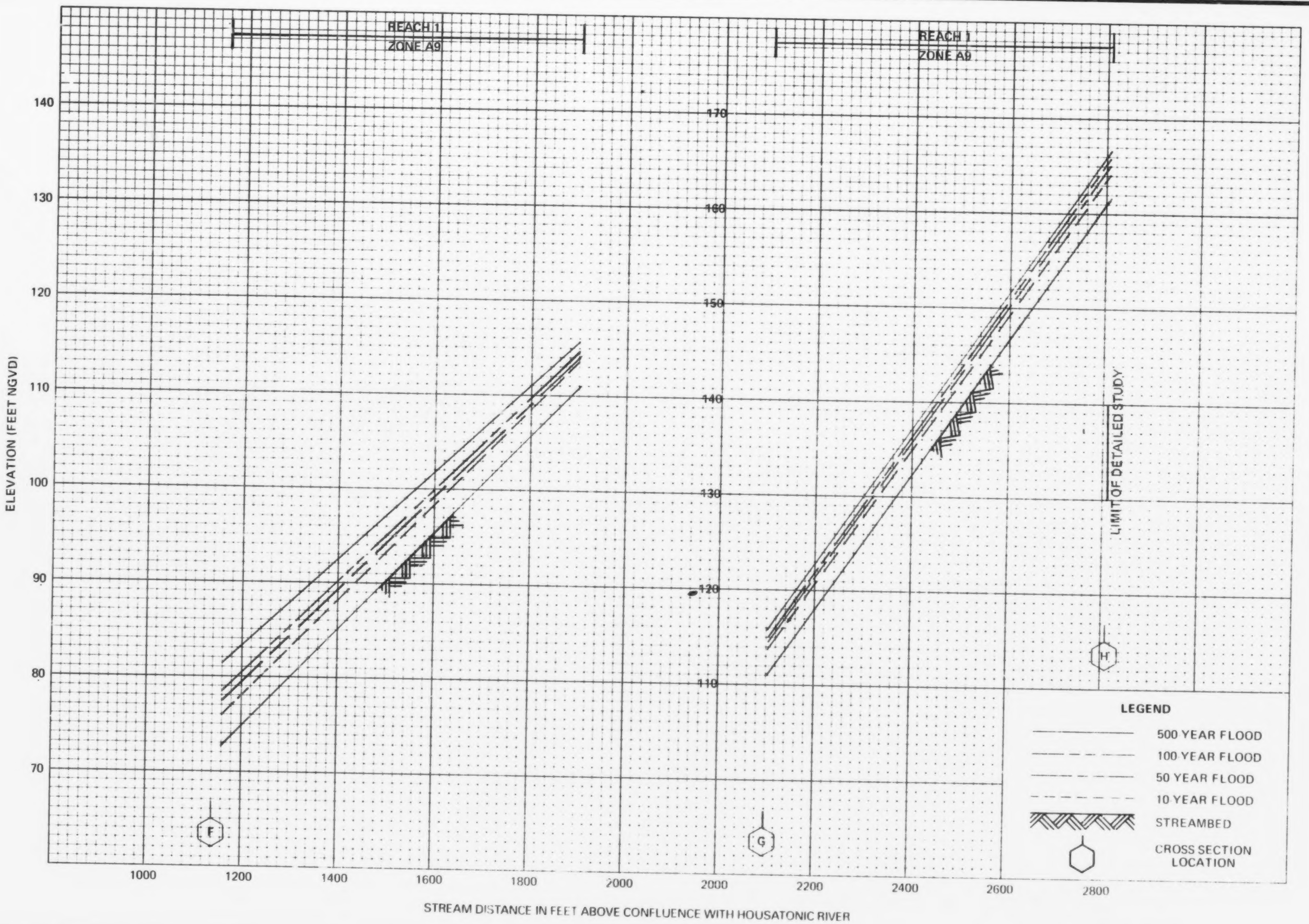
FLOOD PROFILES

FIVEMILE BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

02P



FLOOD PROFILES

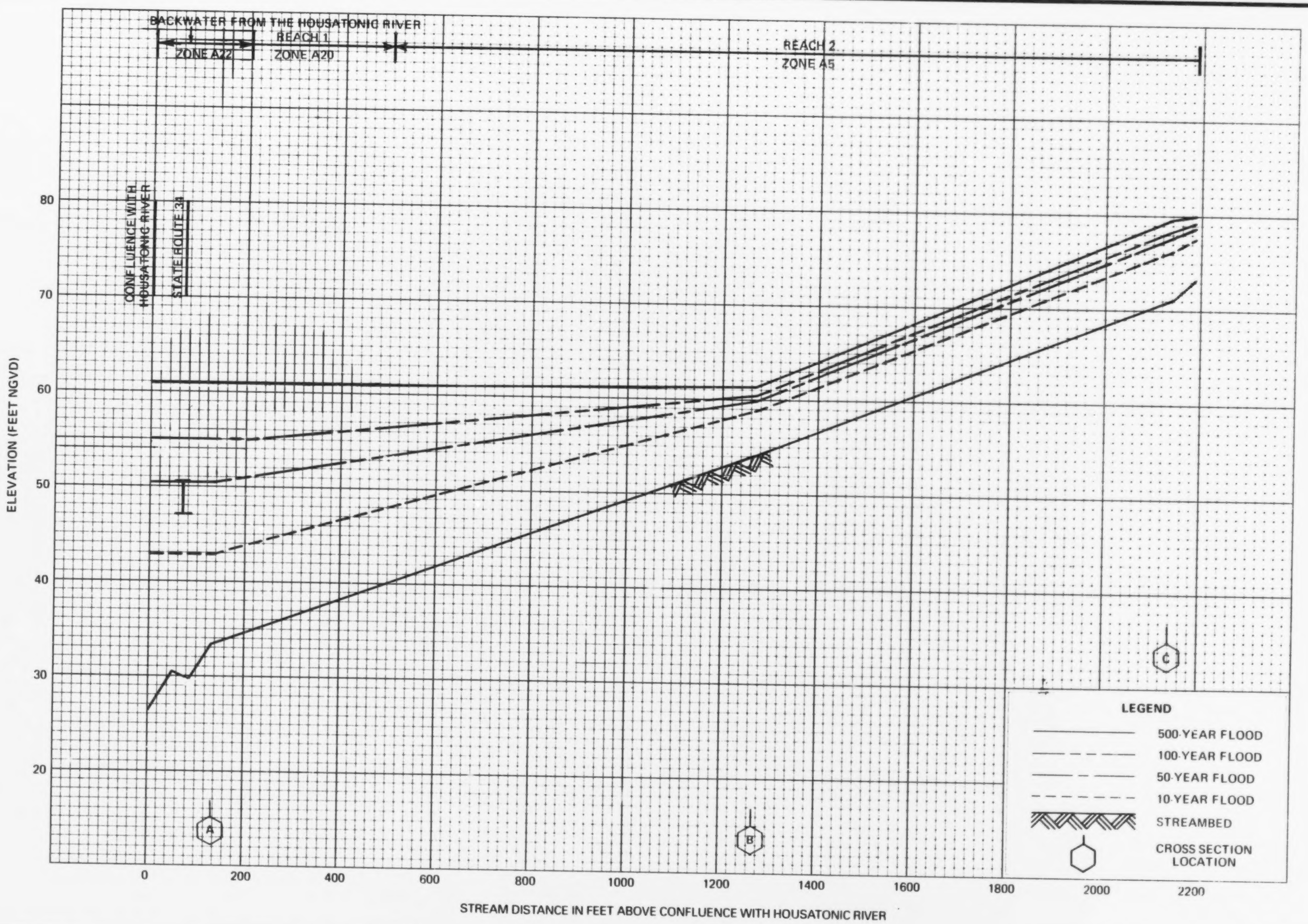
FIVEMILE BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN COUNTY)

03P

26



FLOOD PROFILES

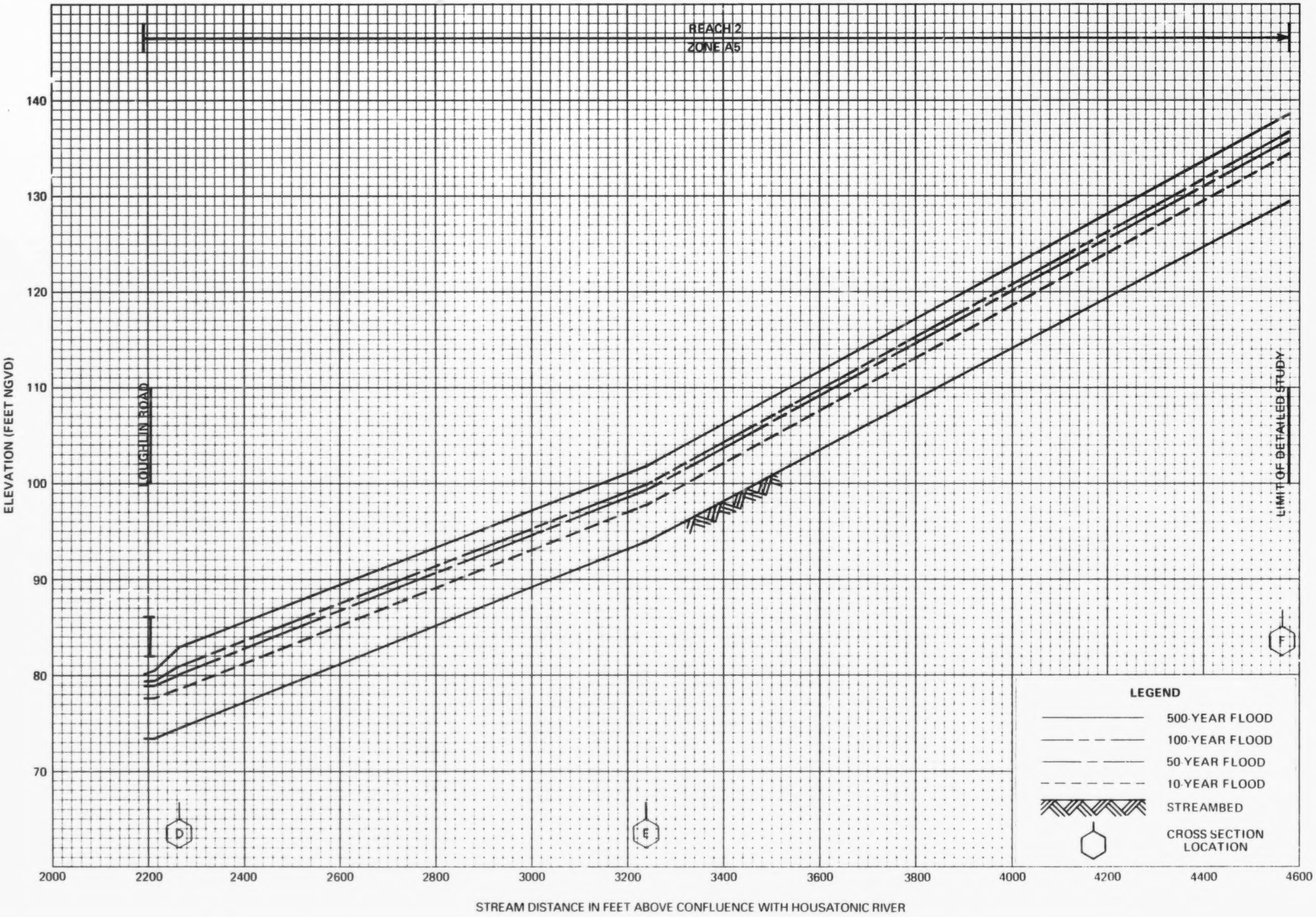
EIGHTMILE BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

04P

27



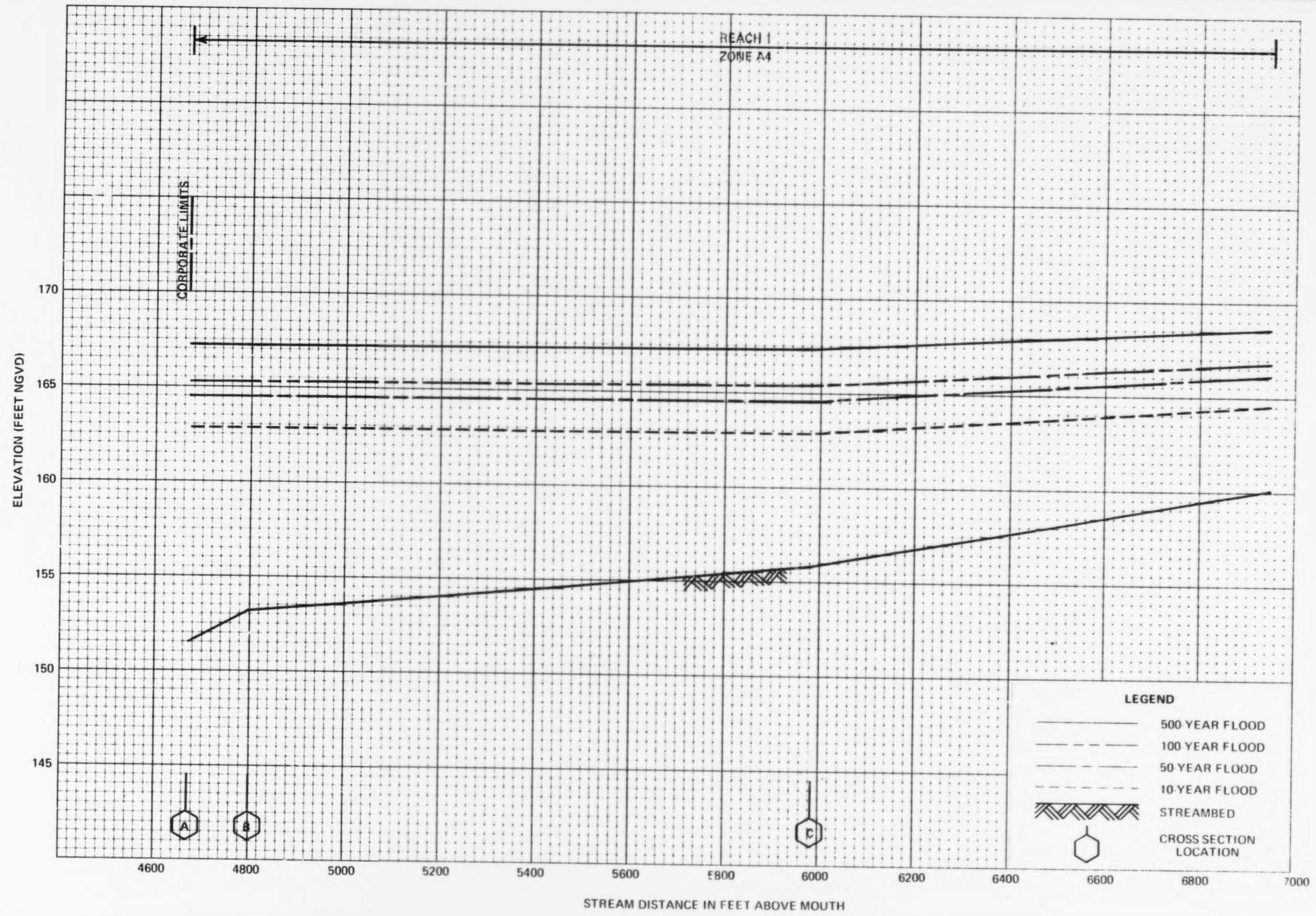
FLOOD PROFILES

EIGHTMILE BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

05P



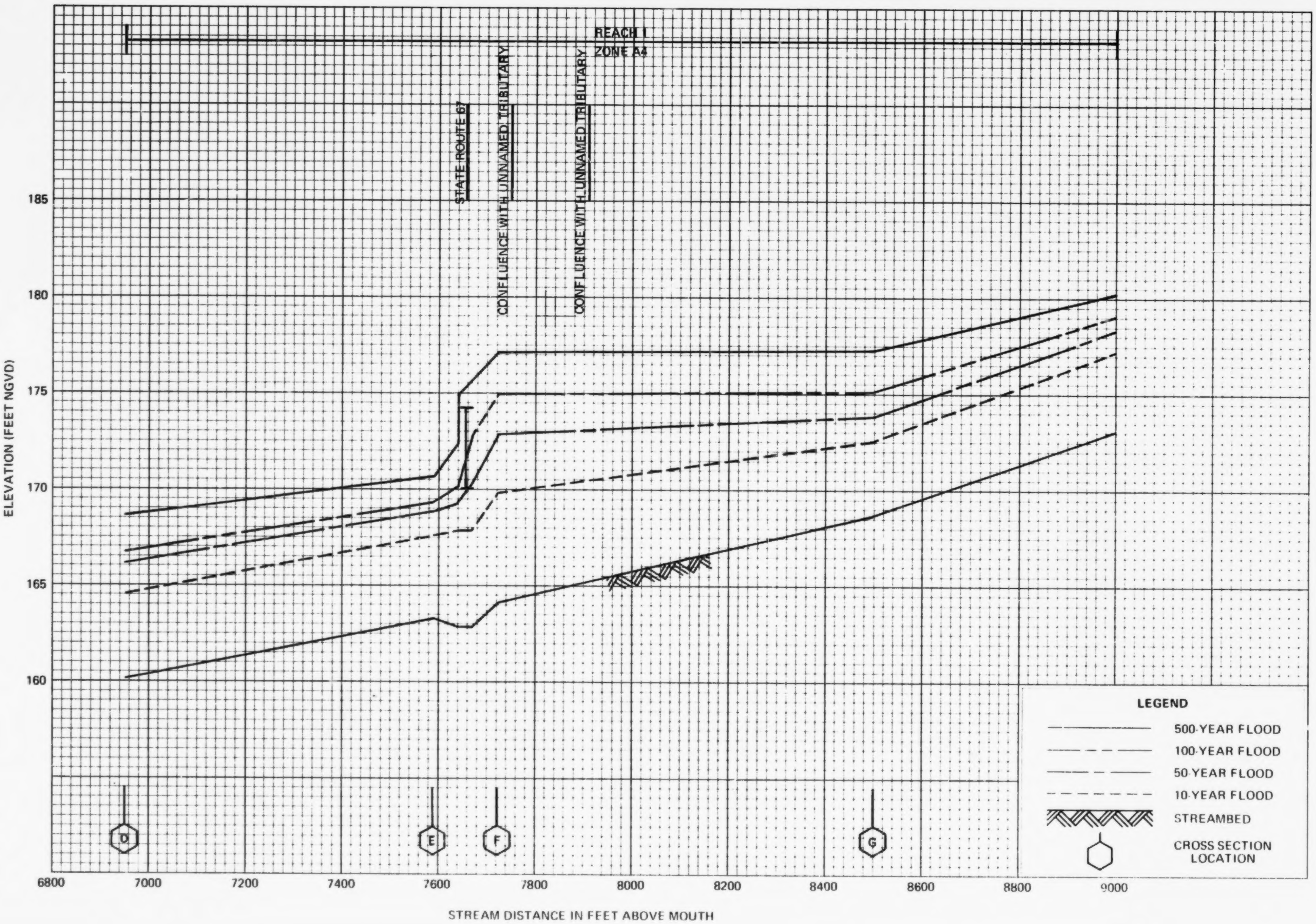
FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

06P



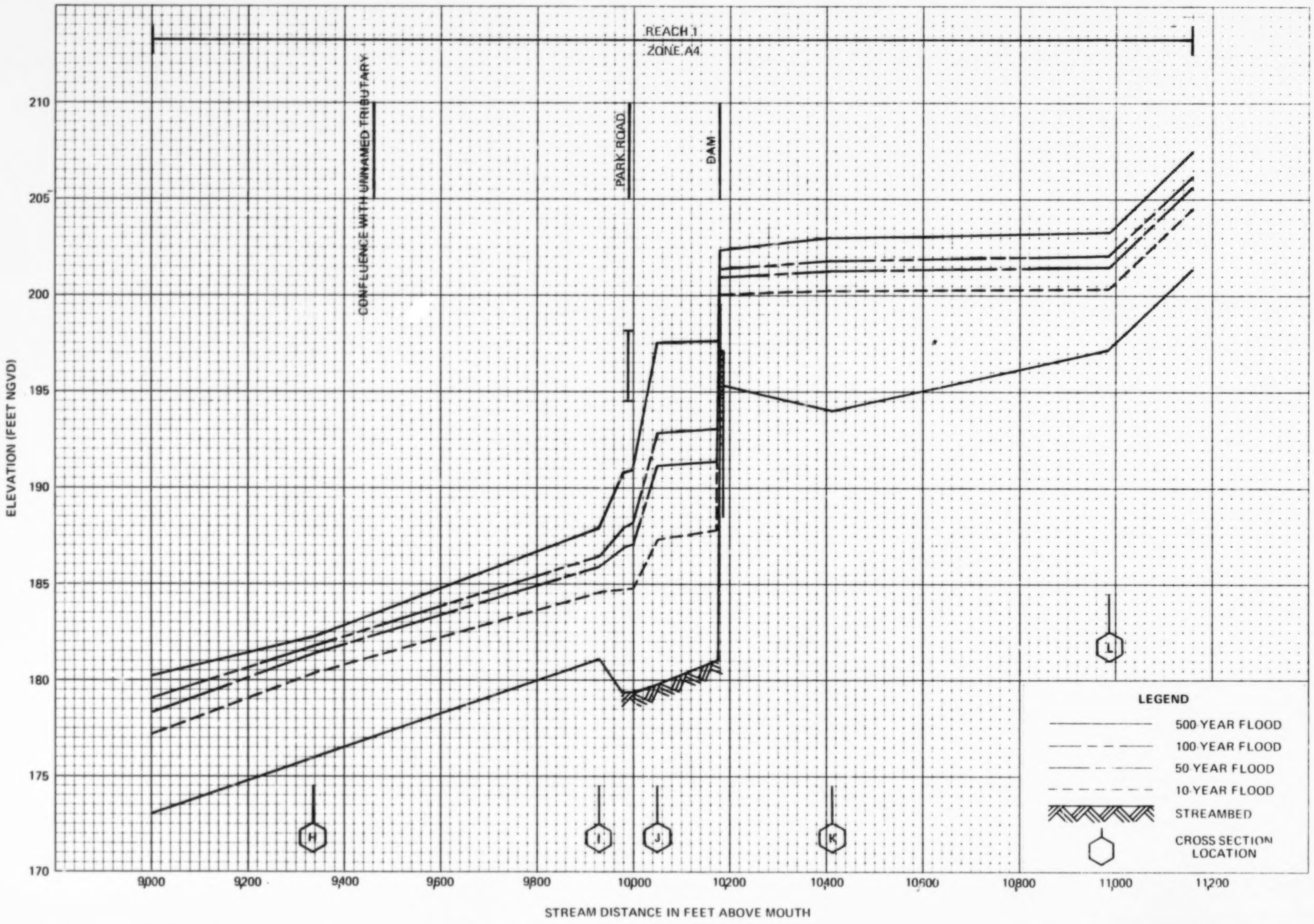
FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

07P



FLOOD PROFILES

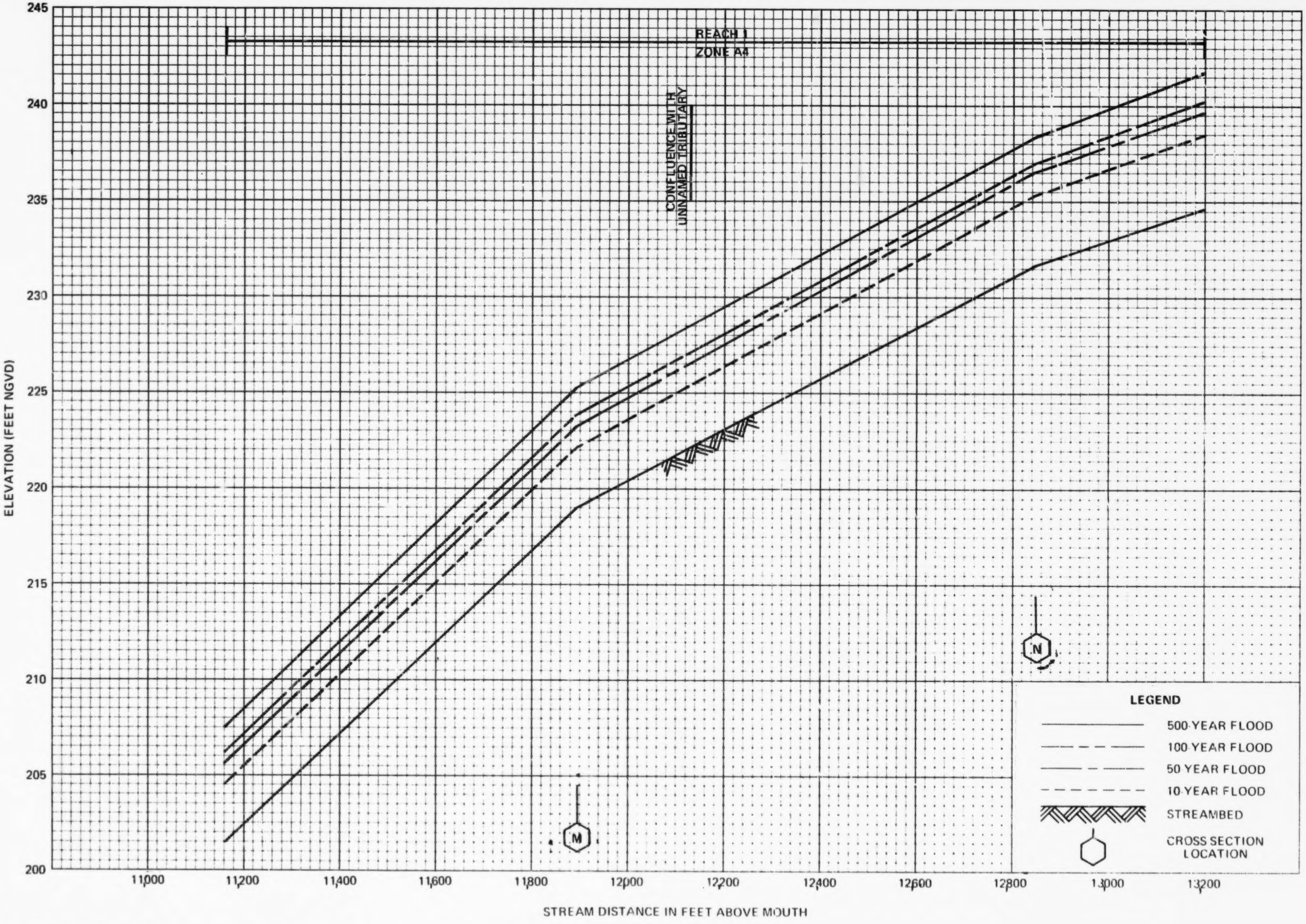
LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

08P

31



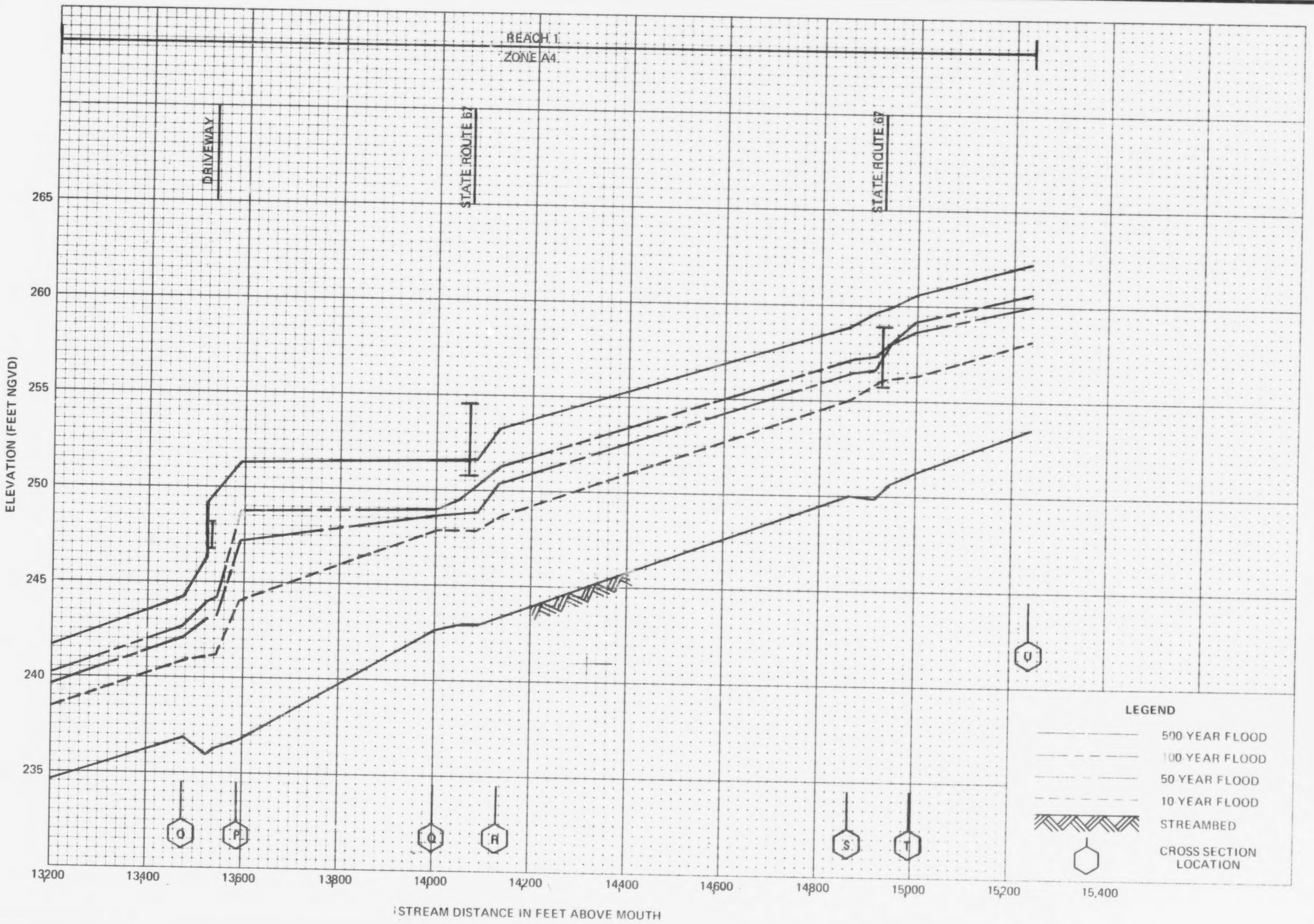
FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

09P



FLOOD PROFILES

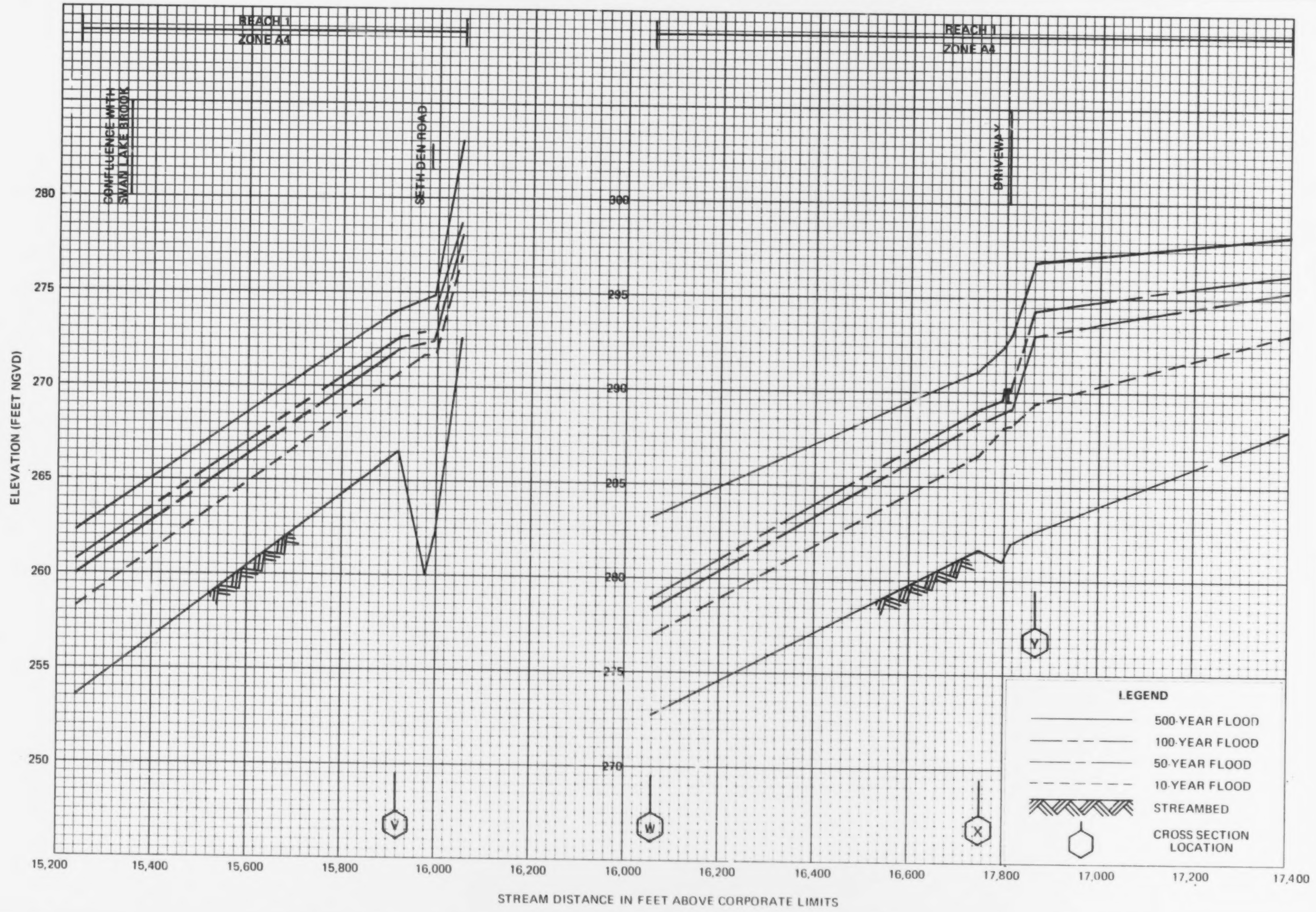
LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

(NEW HAVEN CO.)

10P

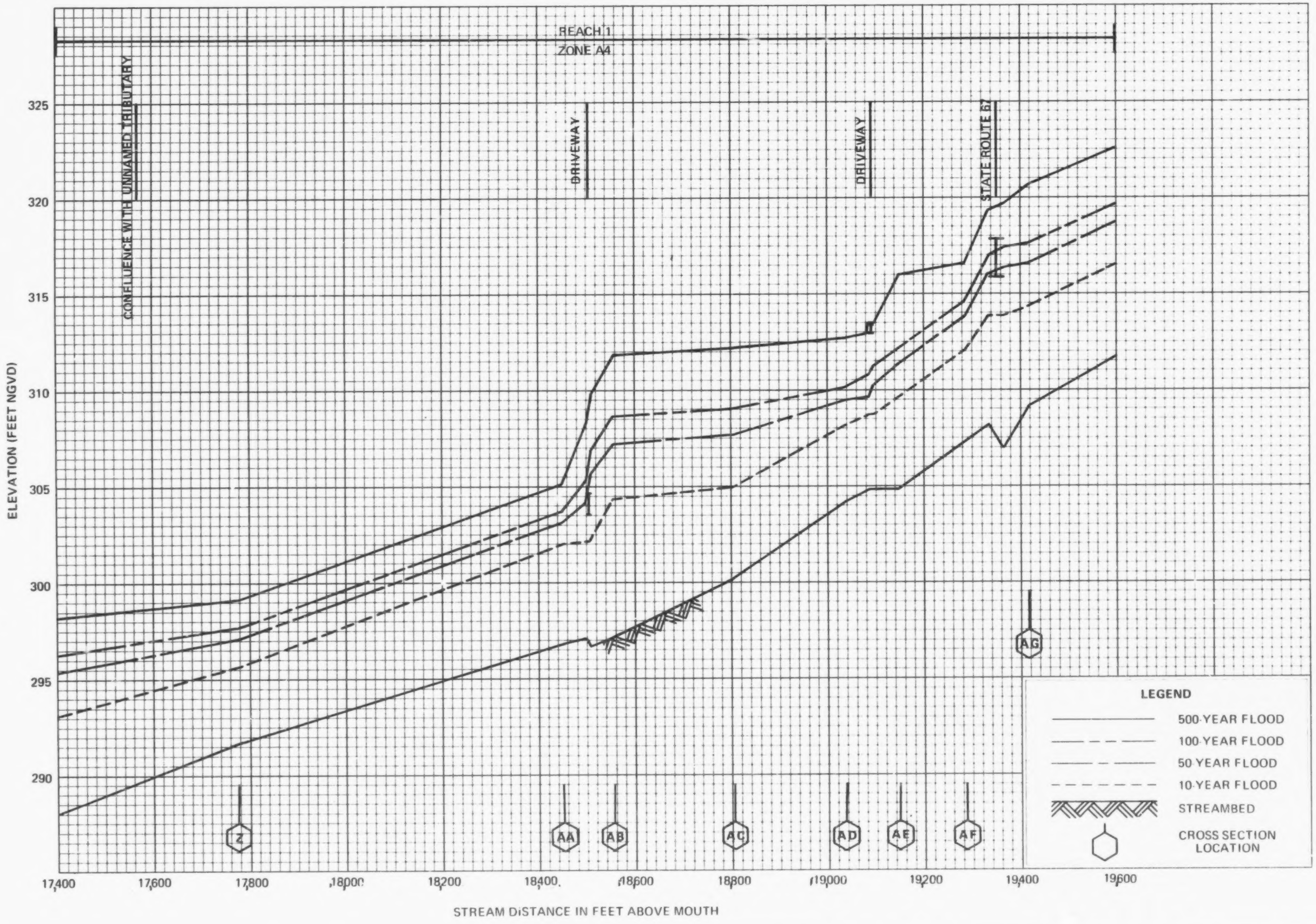


FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN COUNTY)

FLOOD PROFILES

LITTLE RIVER



FLOOD PROFILES

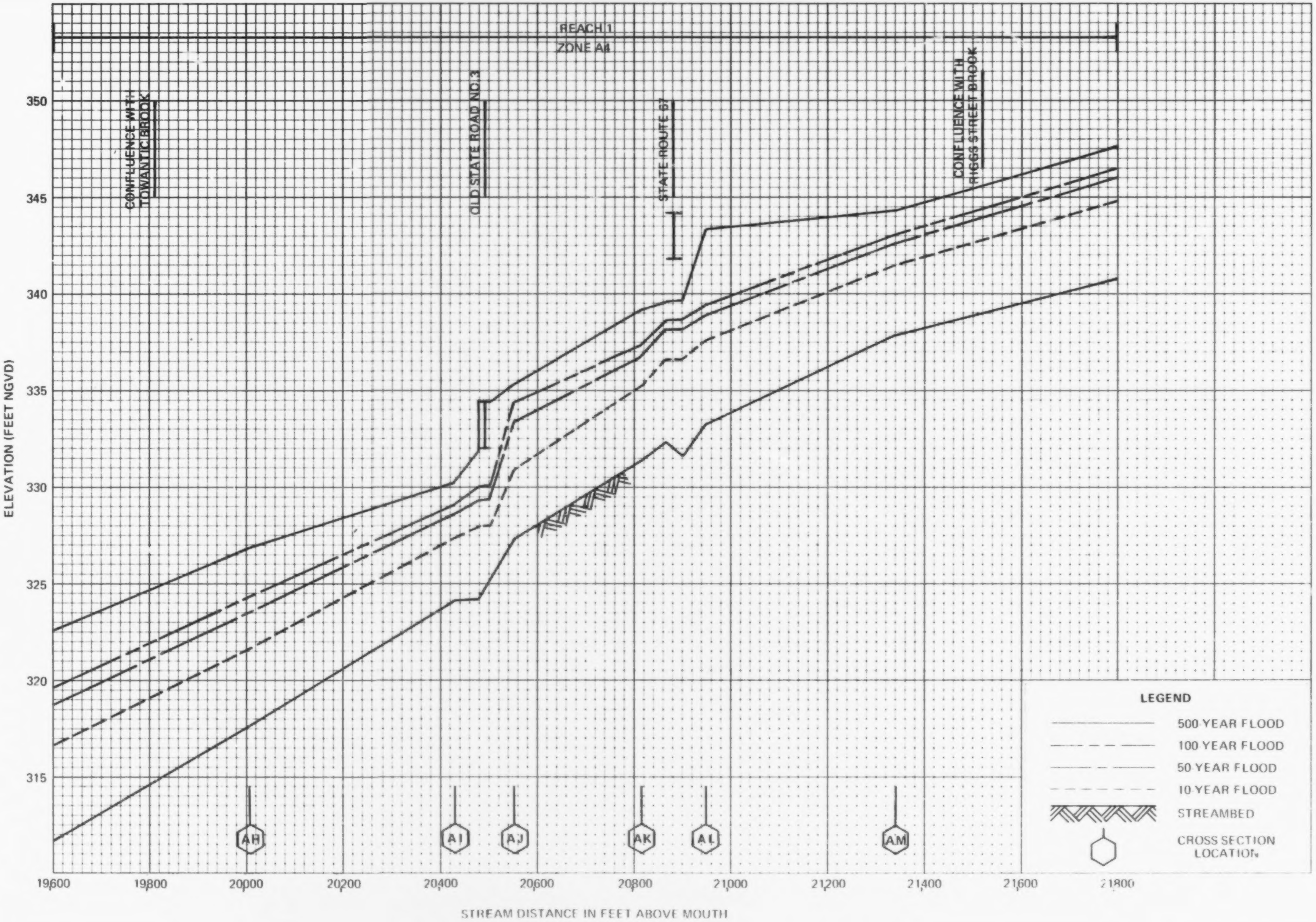
LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

(NEW HAVEN CO.)

12P

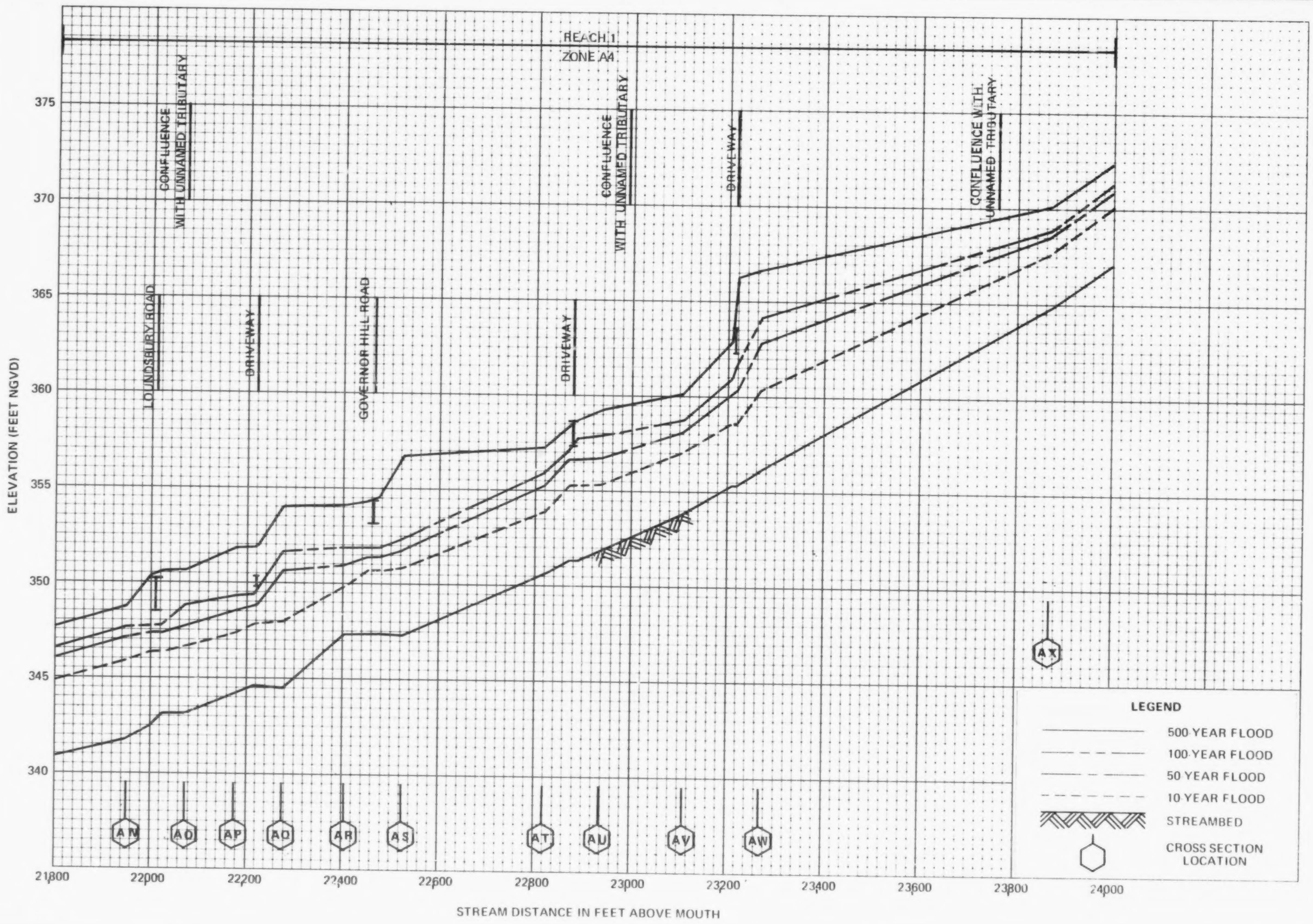


FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

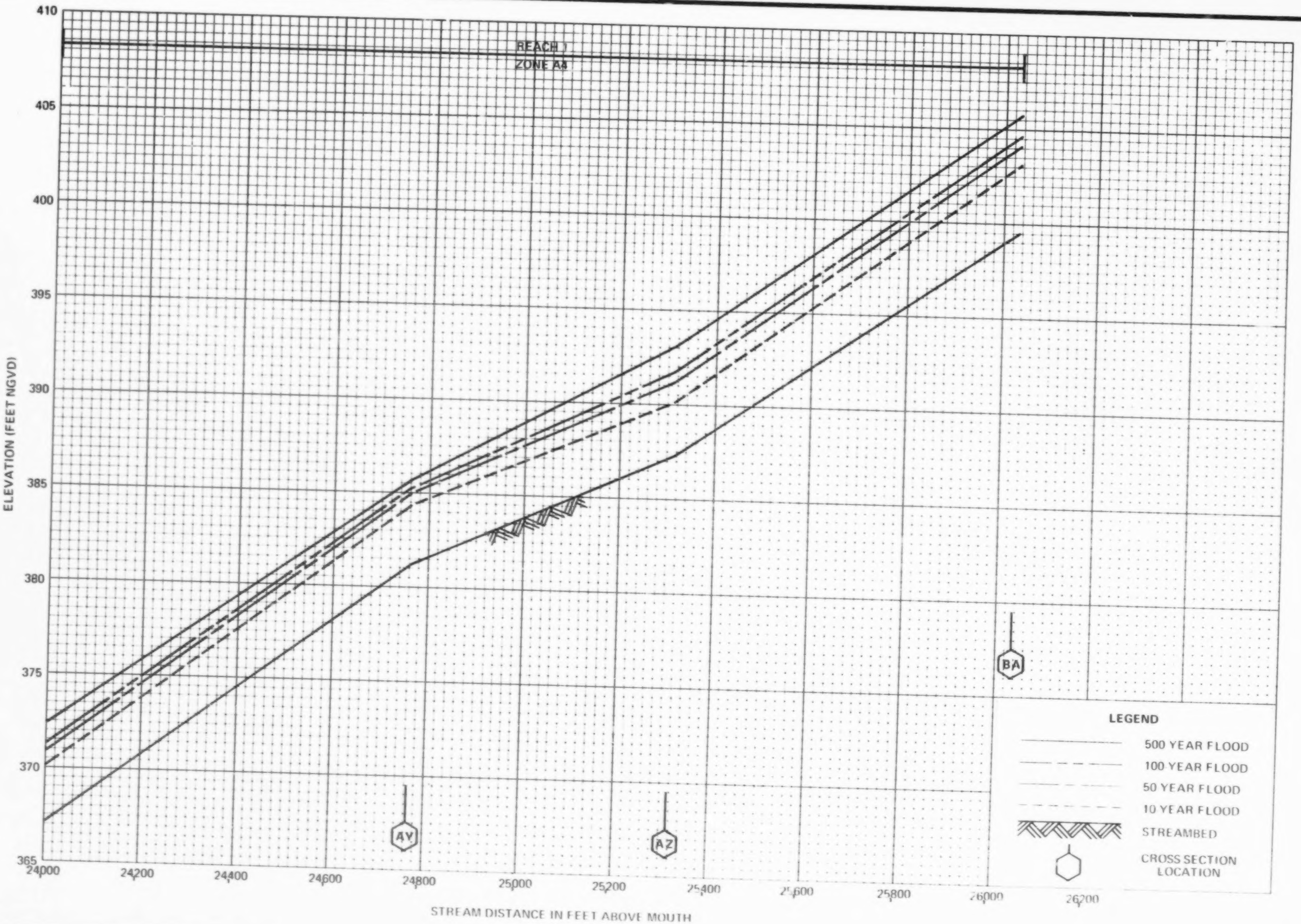


FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

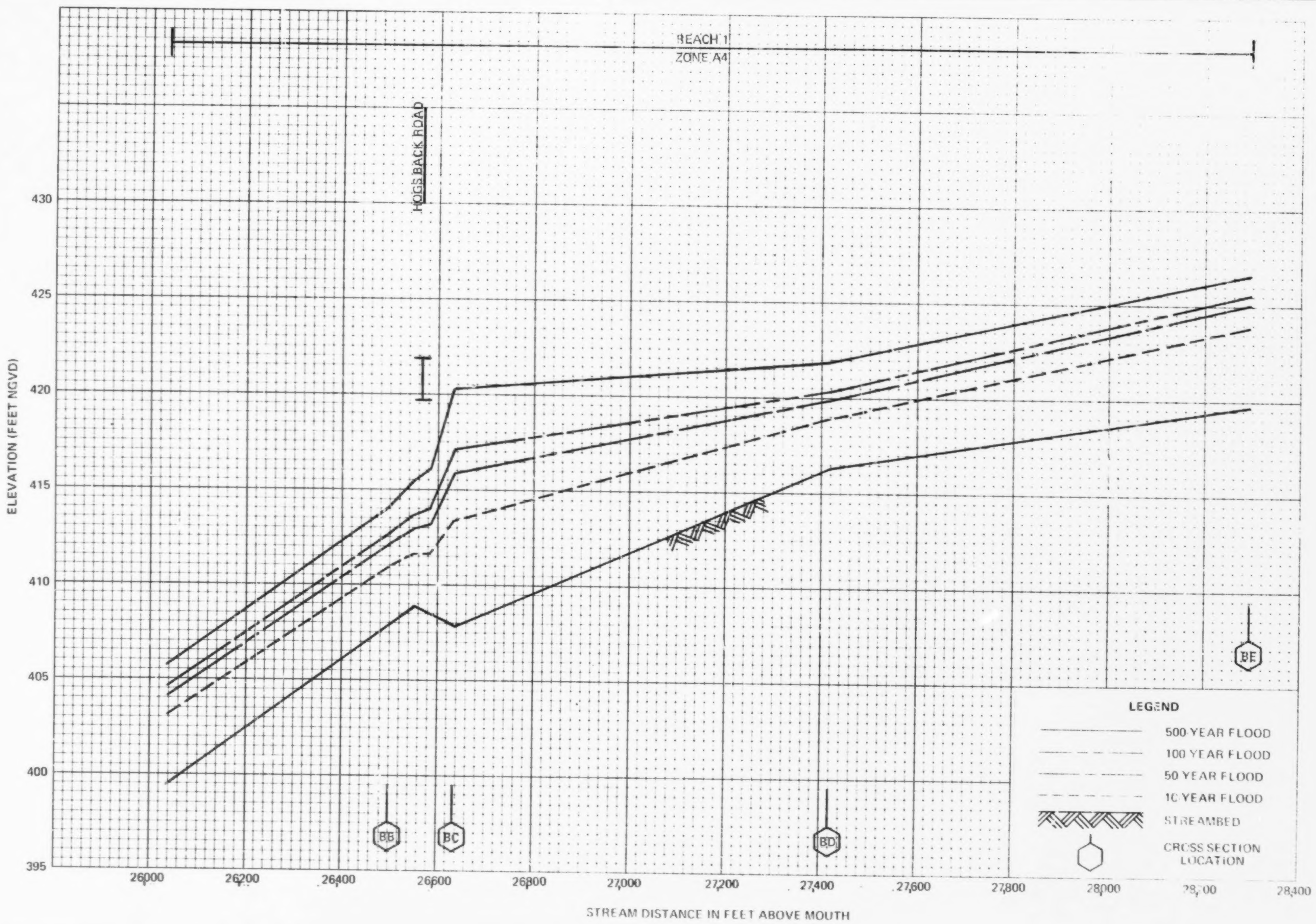


FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

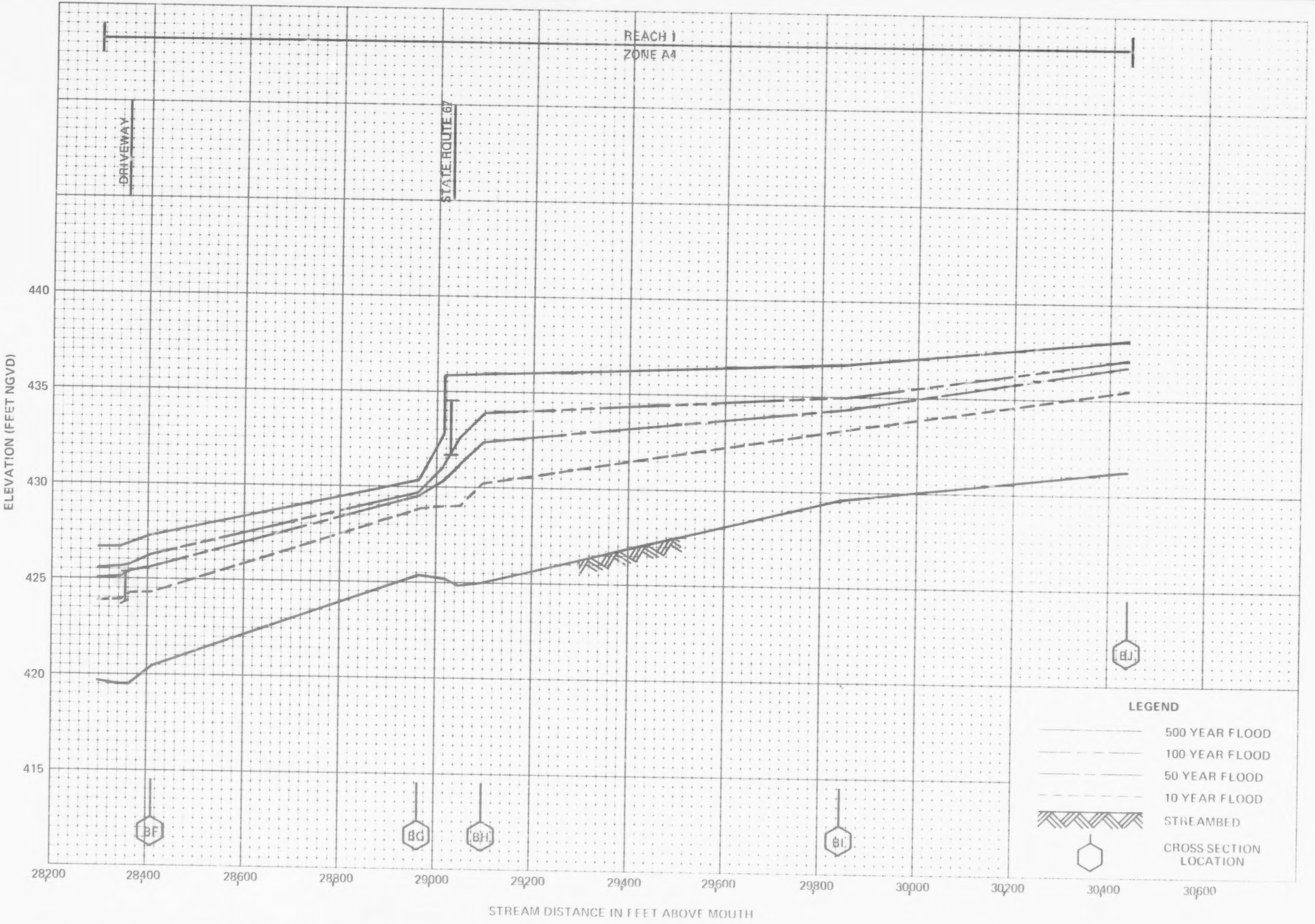


FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

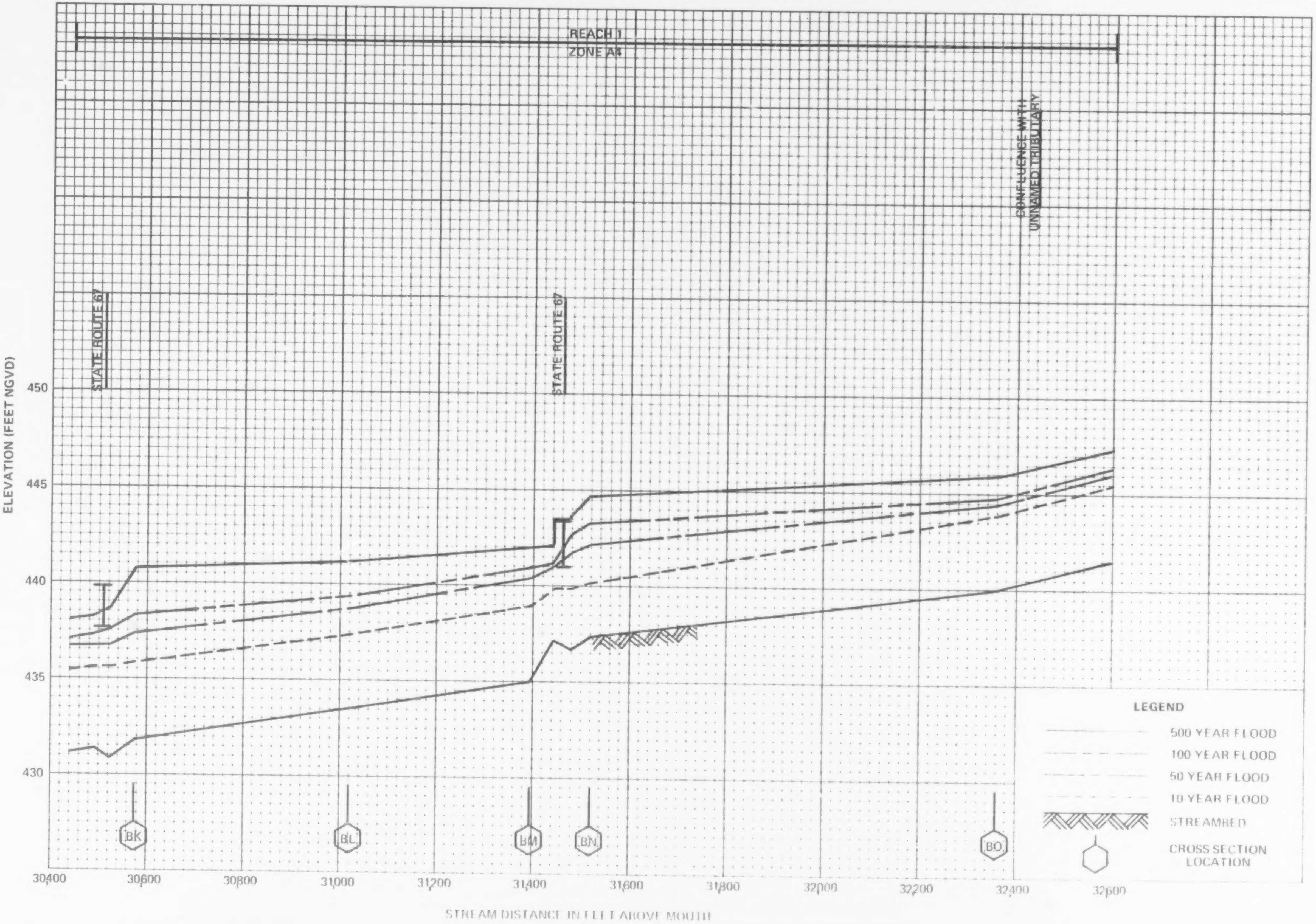


FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

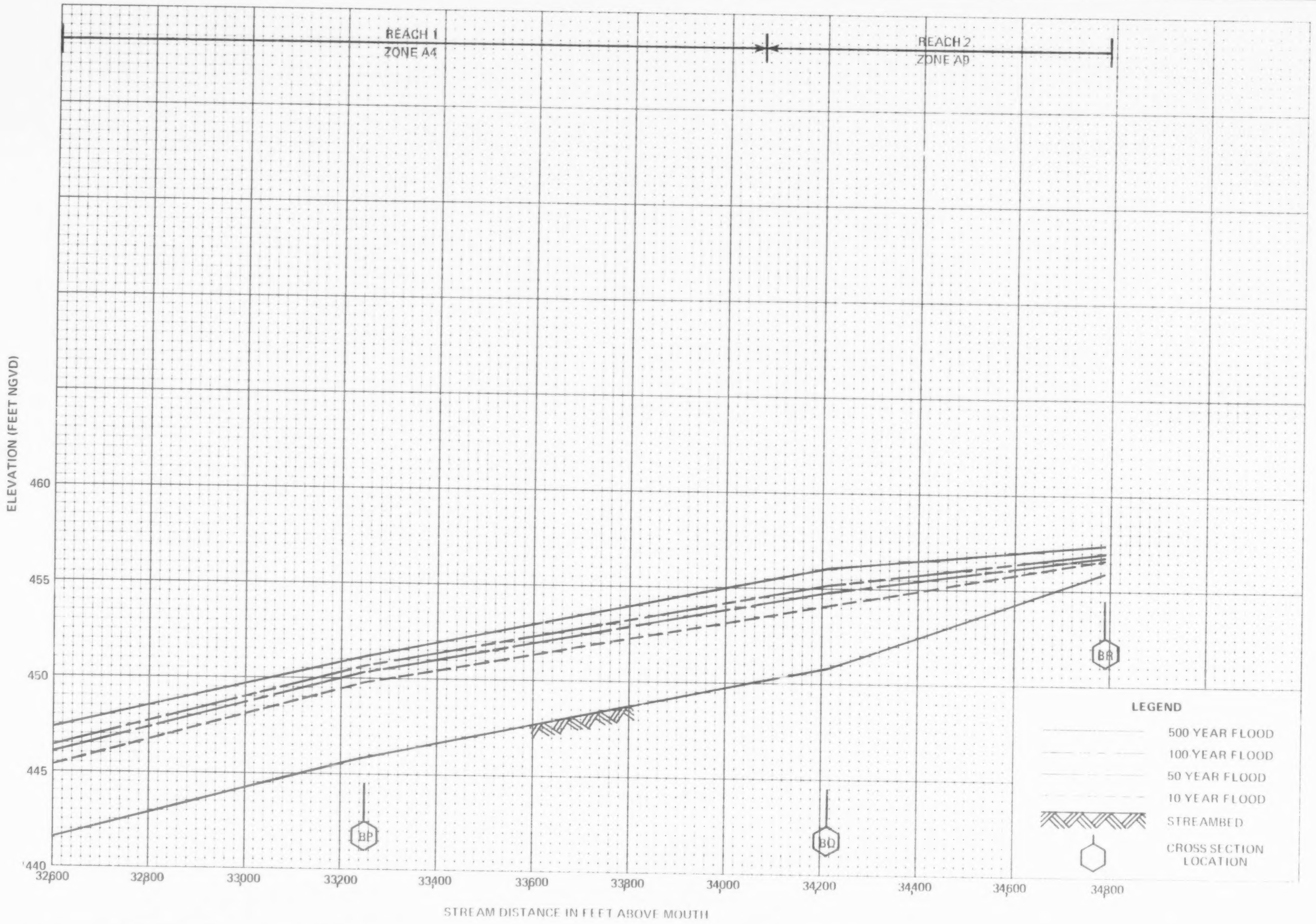


FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)



FLOOD PROFILES

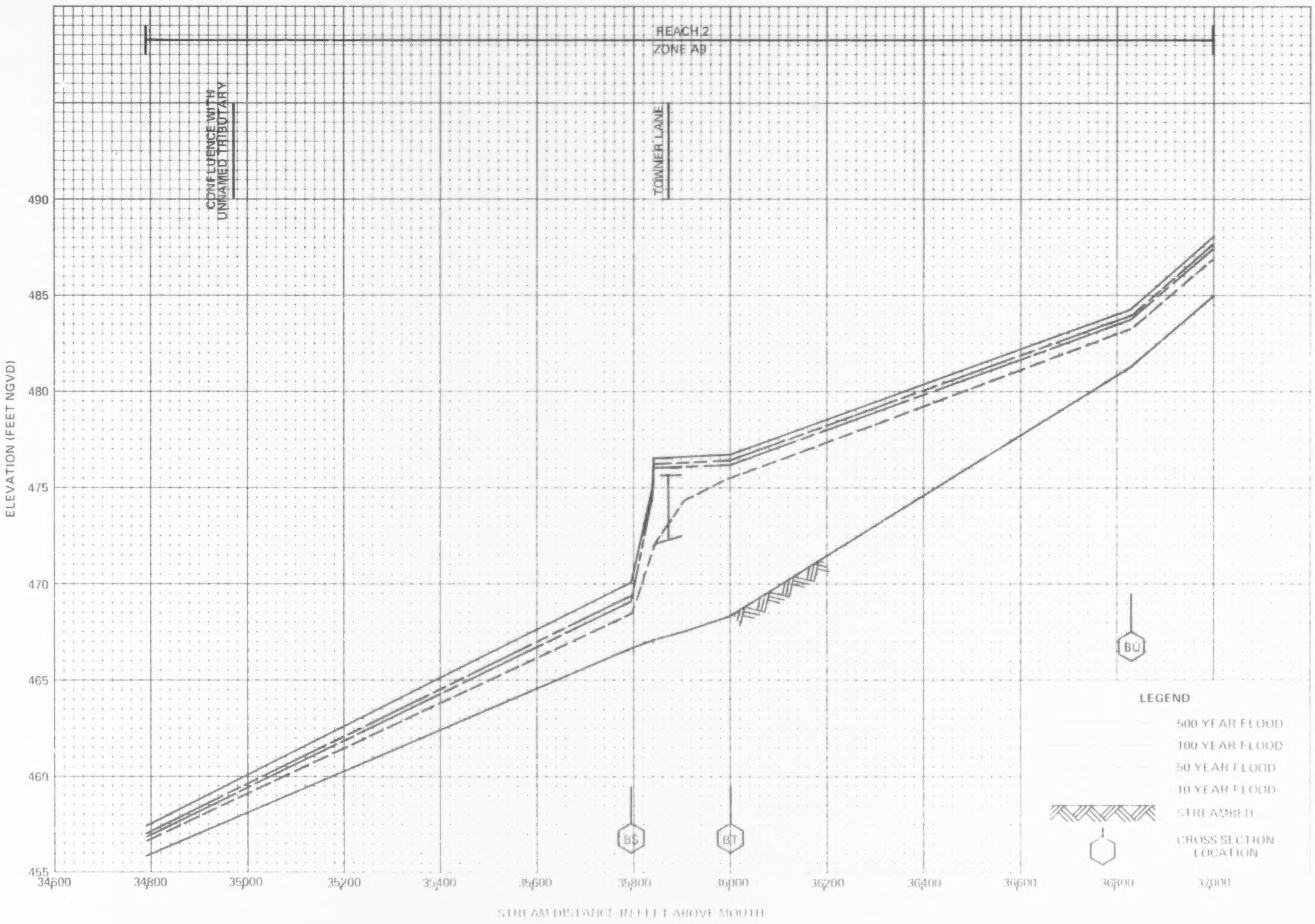
LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

(NEW HAVEN CO.)

19P

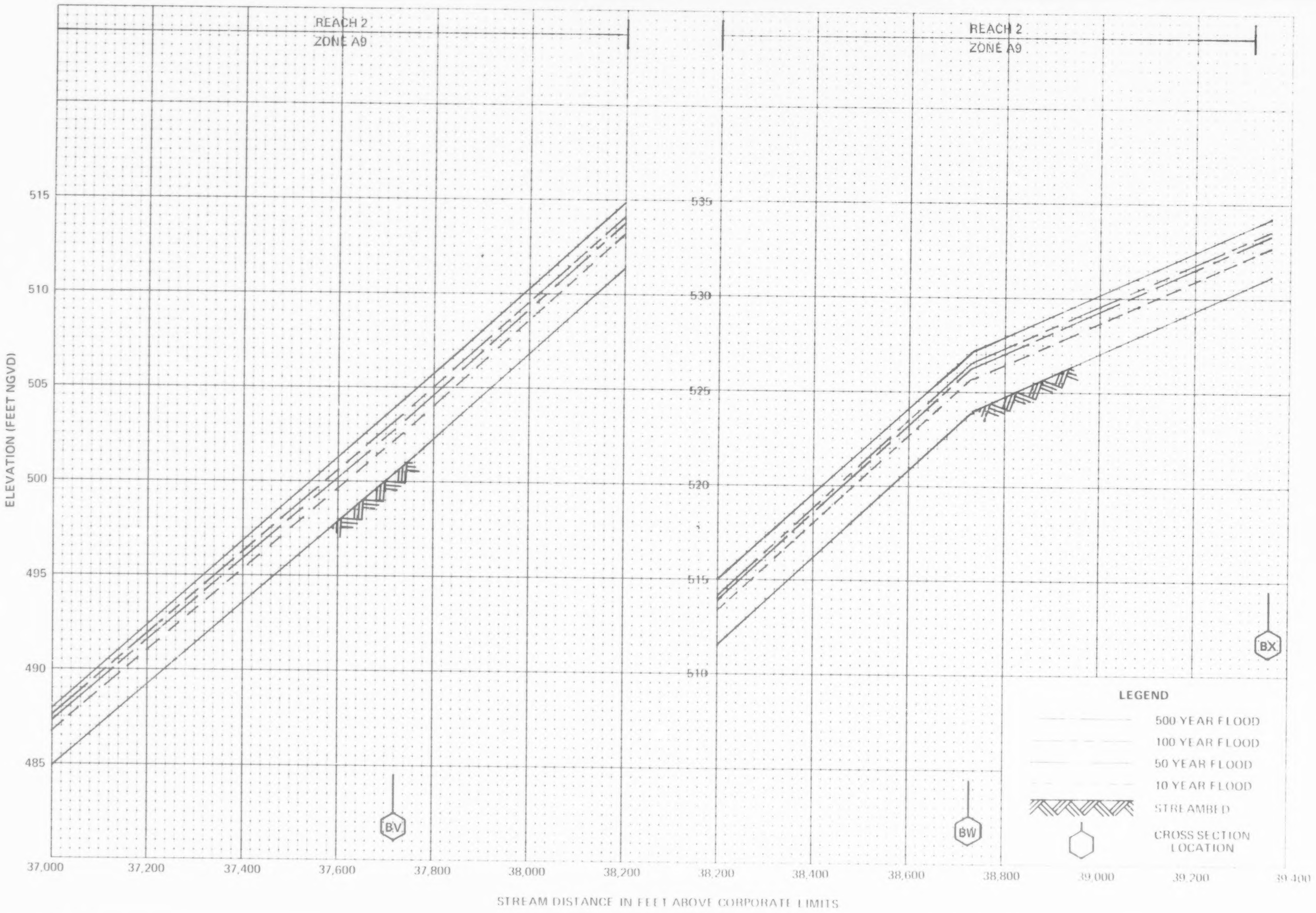


FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

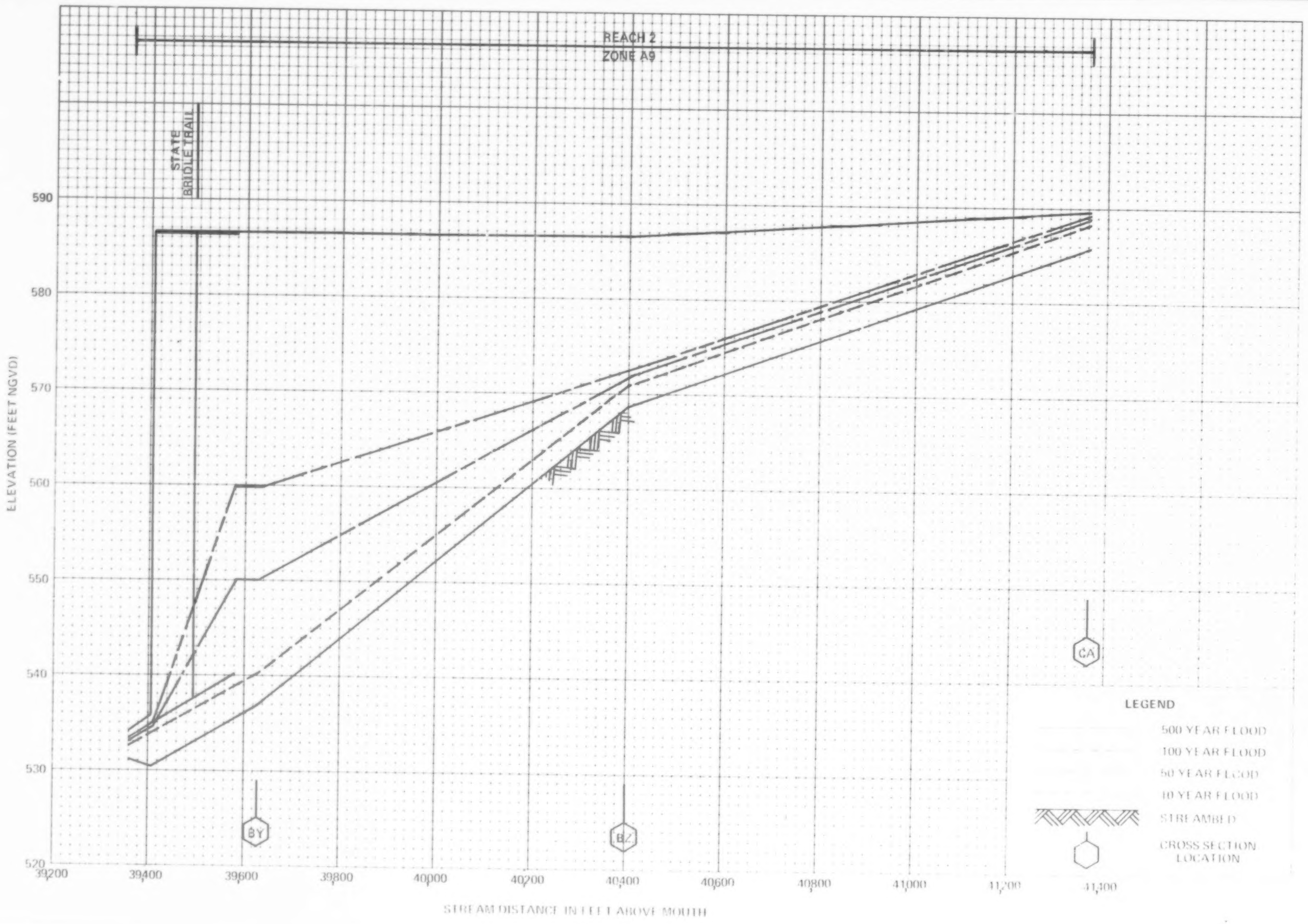


FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN COUNTY)



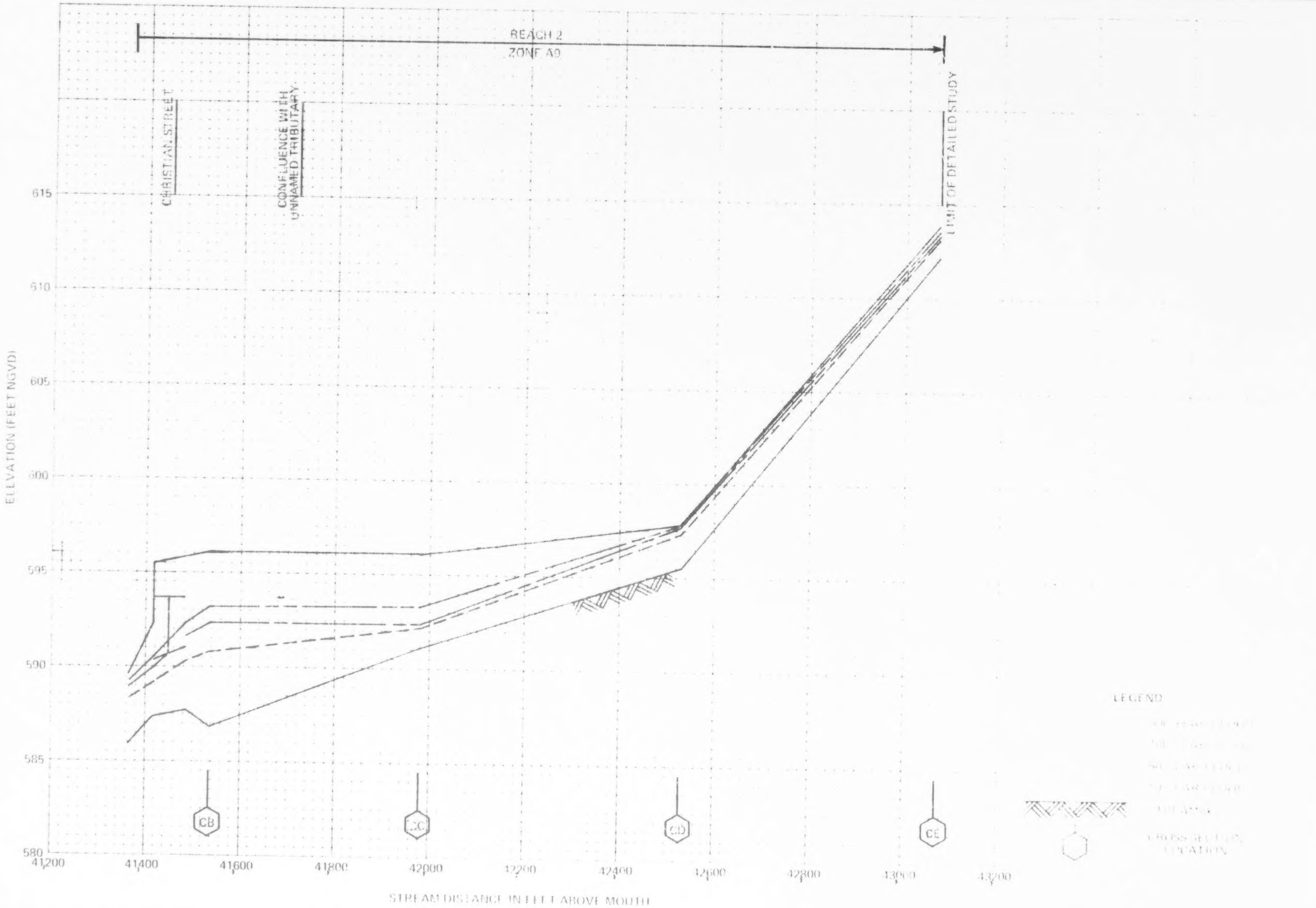
FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

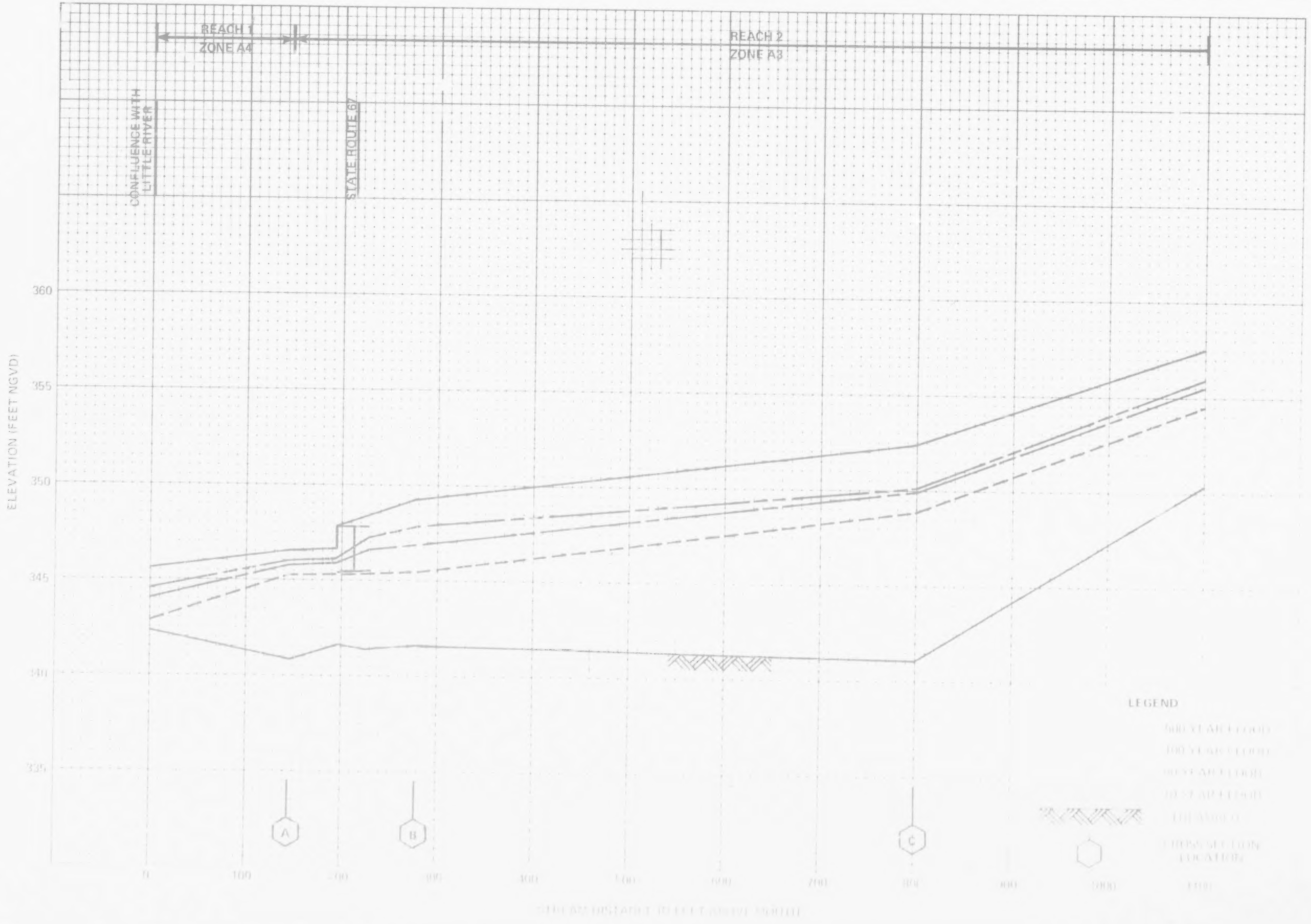
(NEW HAVEN CO.)



FLOOD PROFILES

LITTLE RIVER

TOWN OF OXFORD, CT
NEW HAVEN CO.

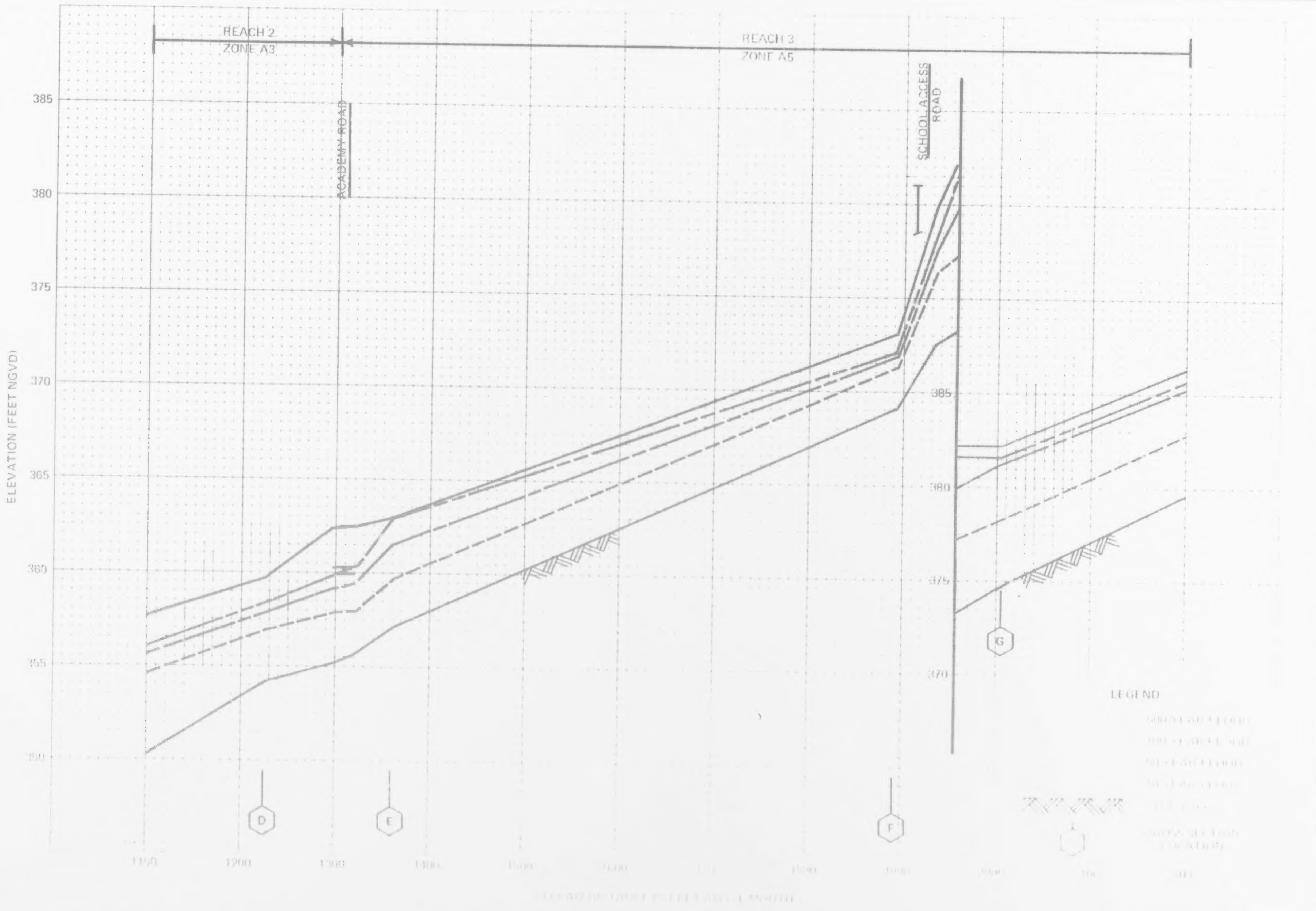


FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
NEW HAVEN CO

FLOOD PROFILES

RIGGS STREET BROOK



FEDERAL EMERGENCY MANAGEMENT AGENCY

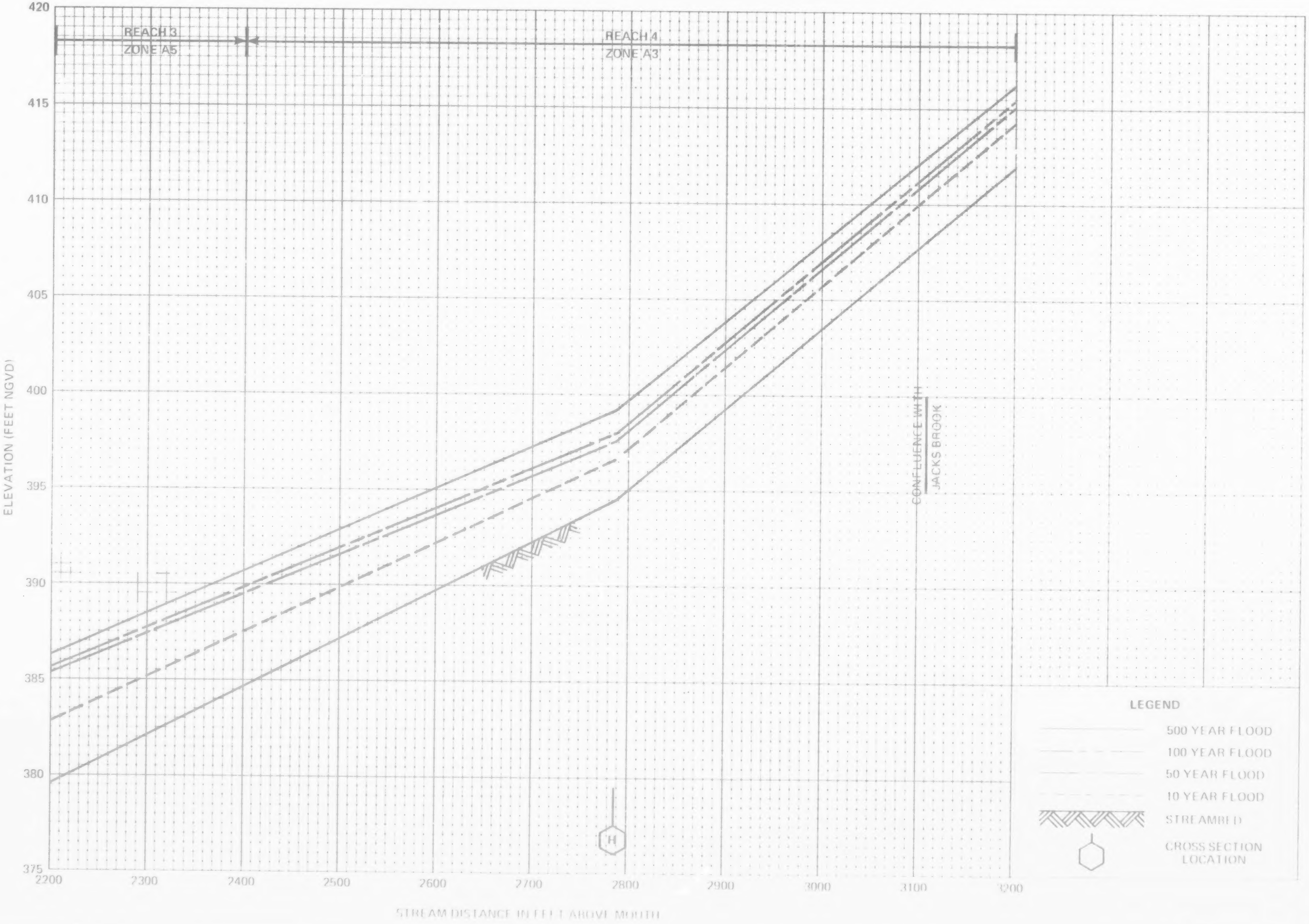
TOWN OF OXFORD, CT

NEW HAVEN CO

FLOOD PROFILES

RIGGS STREET BROOK

25P



FLOOD PROFILES

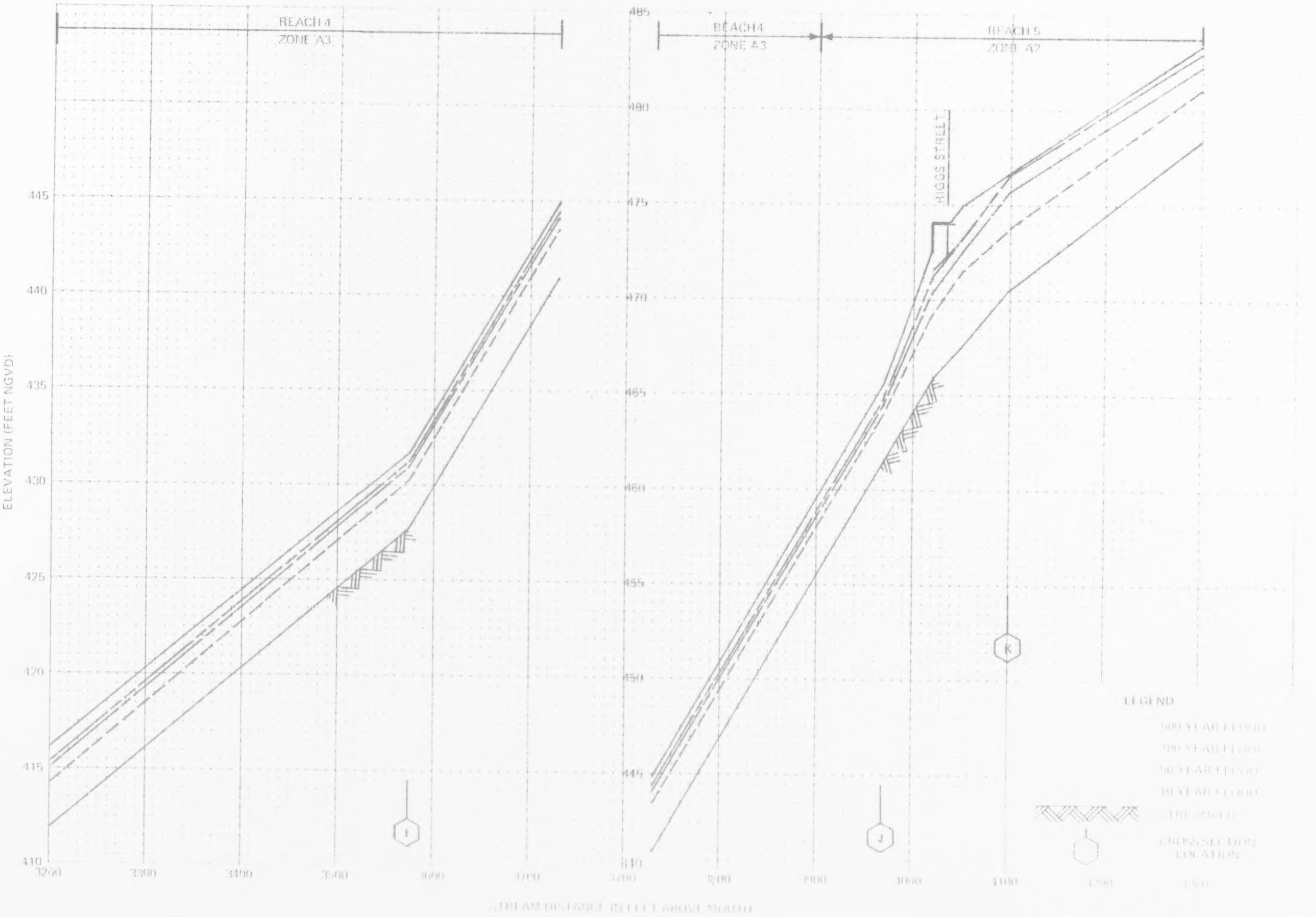
RIGGS STREET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

(NEW HAVEN CO.)

26P

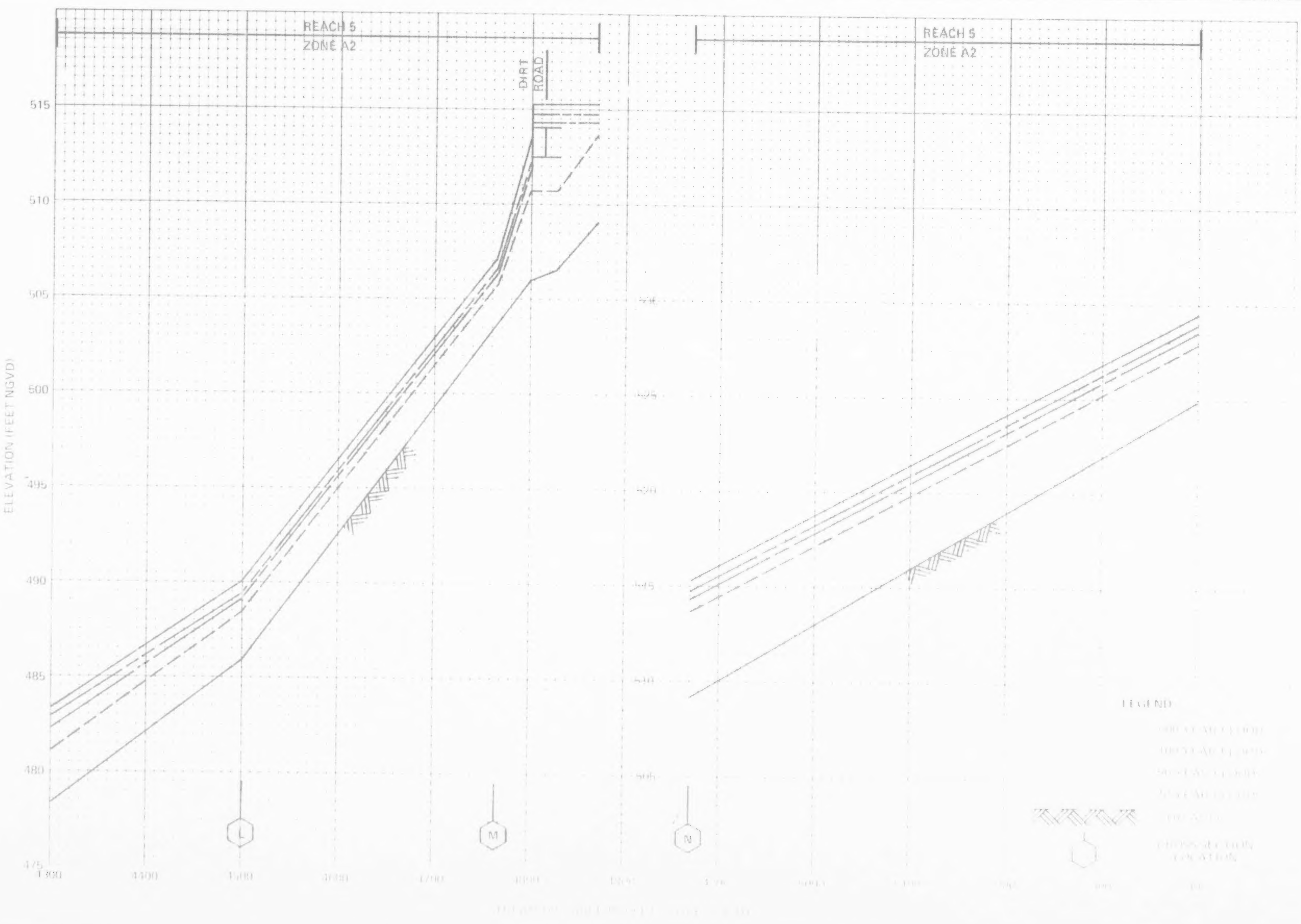


FLOOD PROFILES

RIGGS STREET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
NEW HAVEN CO



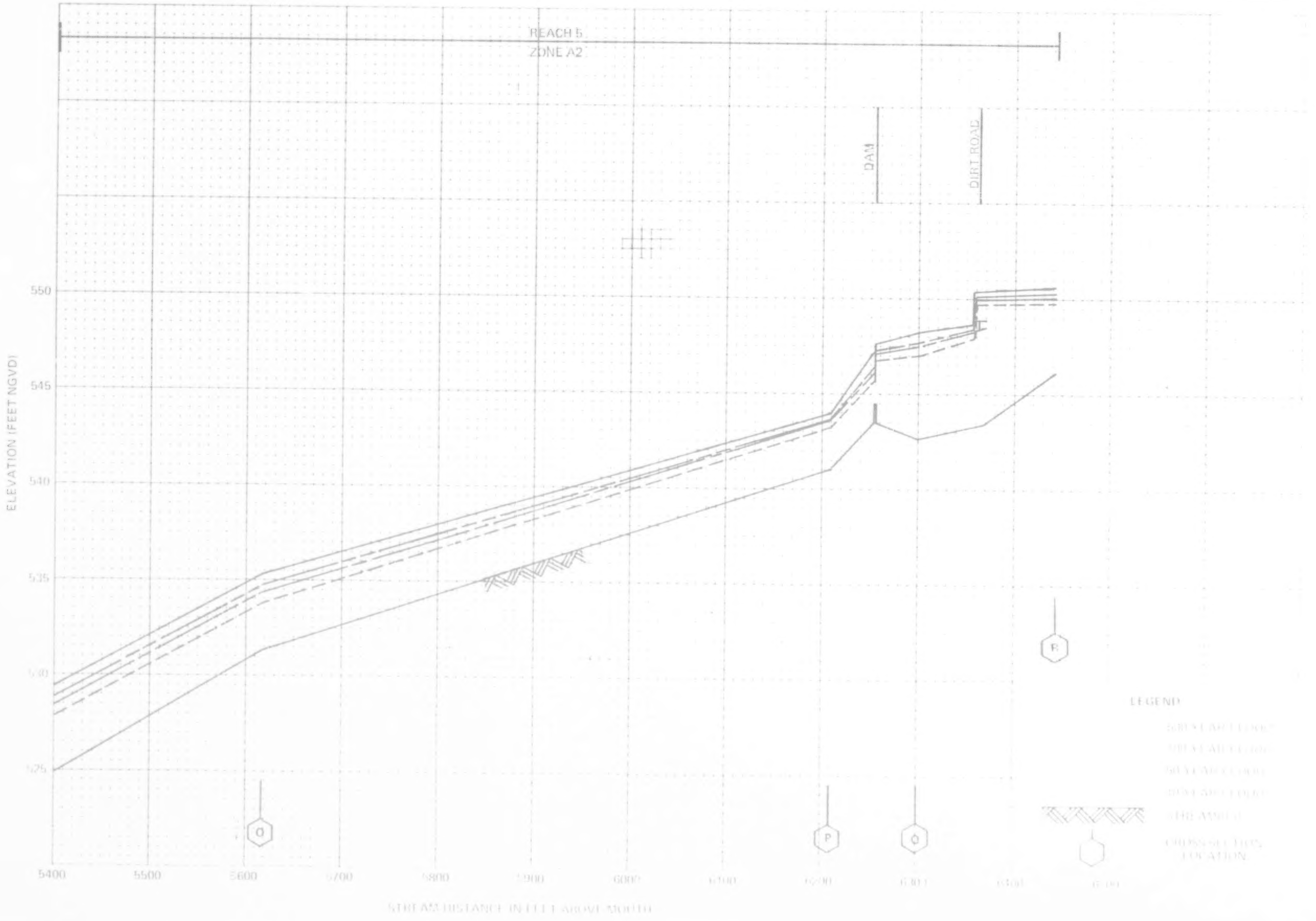
FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOOD PROFILES

RIGGS STREET BROOK

TOWN OF OXFORD, CT

NEW HAVEN CO

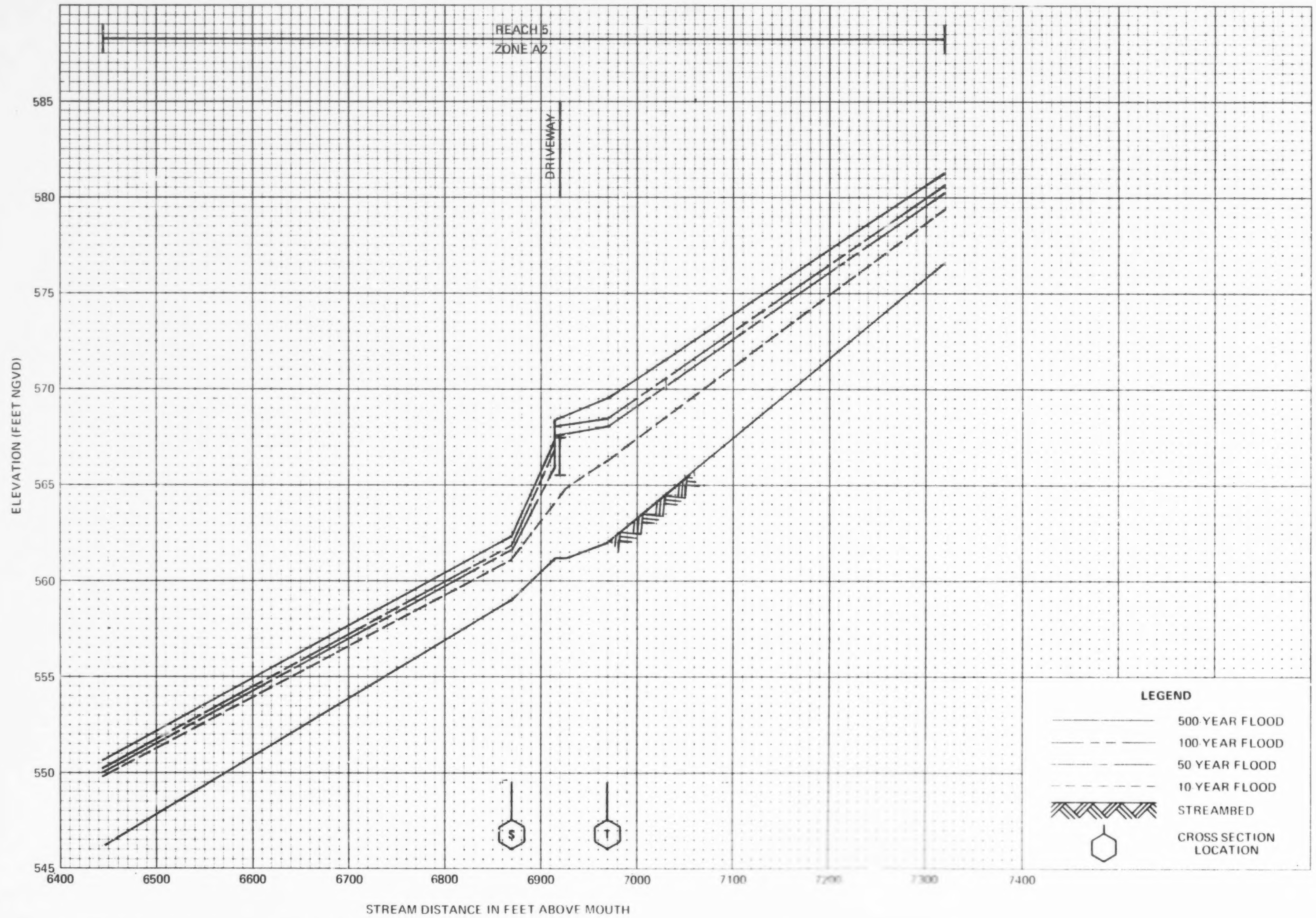


FLOOD PROFILES

RIGGS STREET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
NEW HAVEN CO



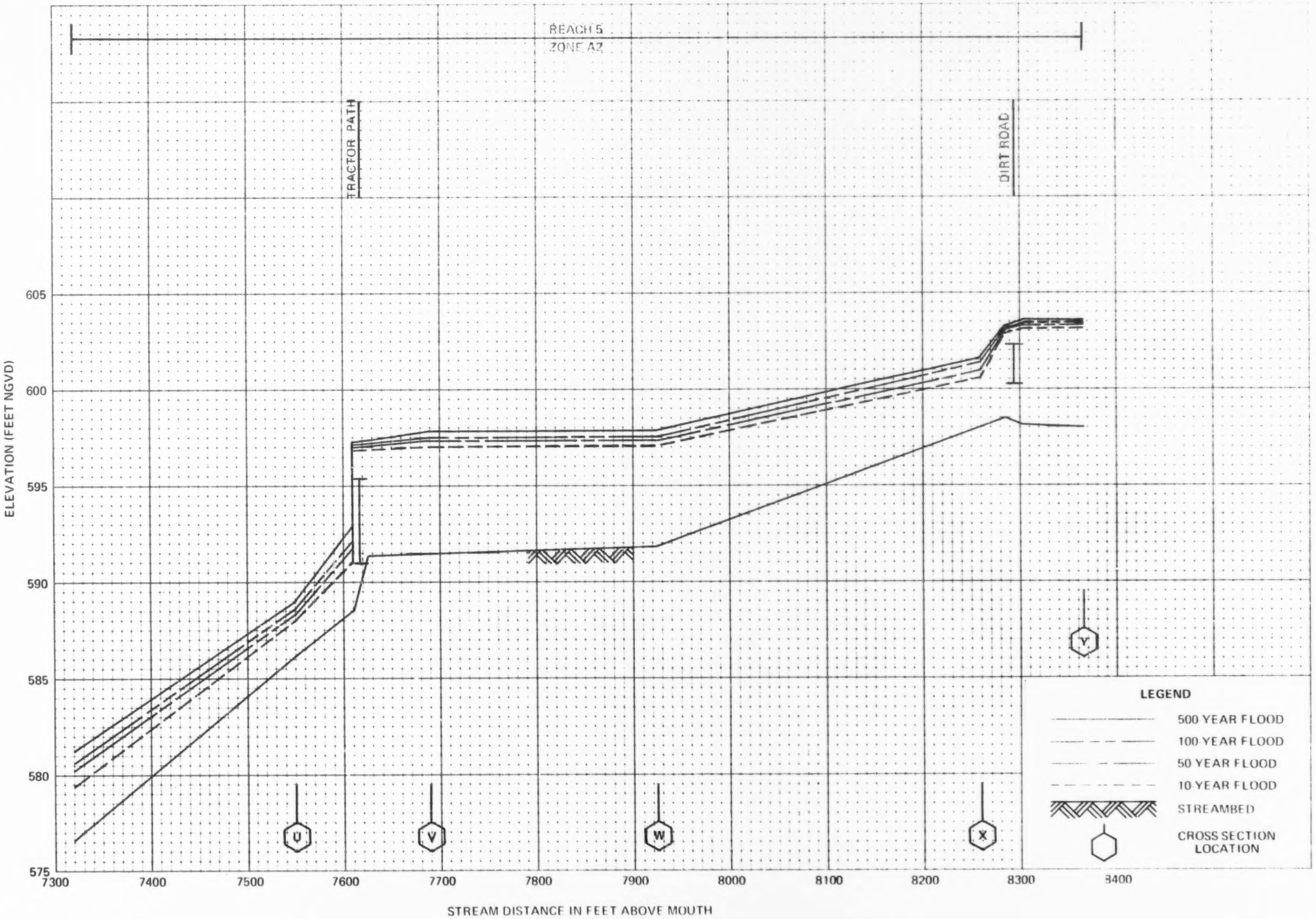
FLOOD PROFILES

RIGGS STREET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

30P

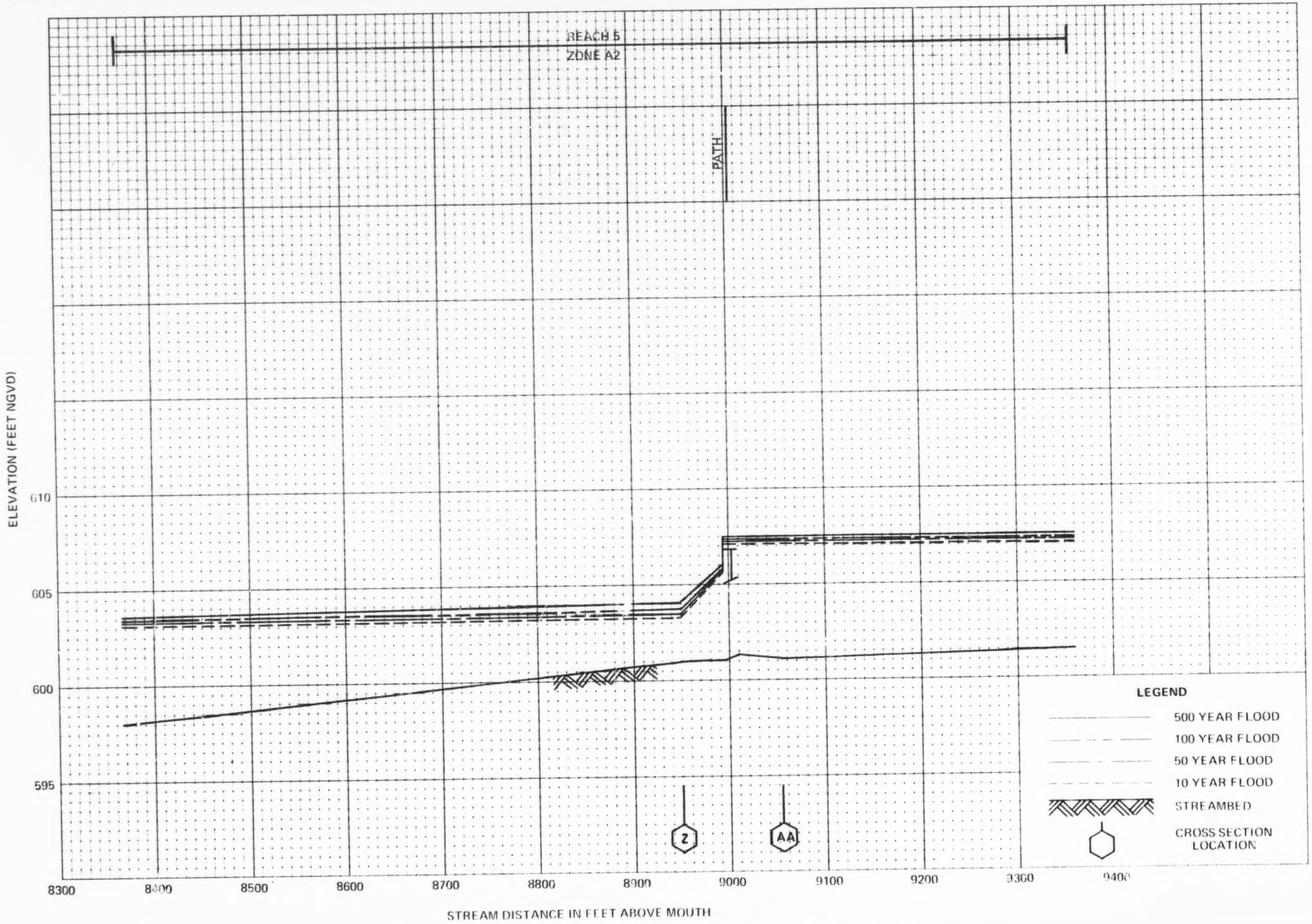


FLOOD PROFILES

RIGGS STREET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)



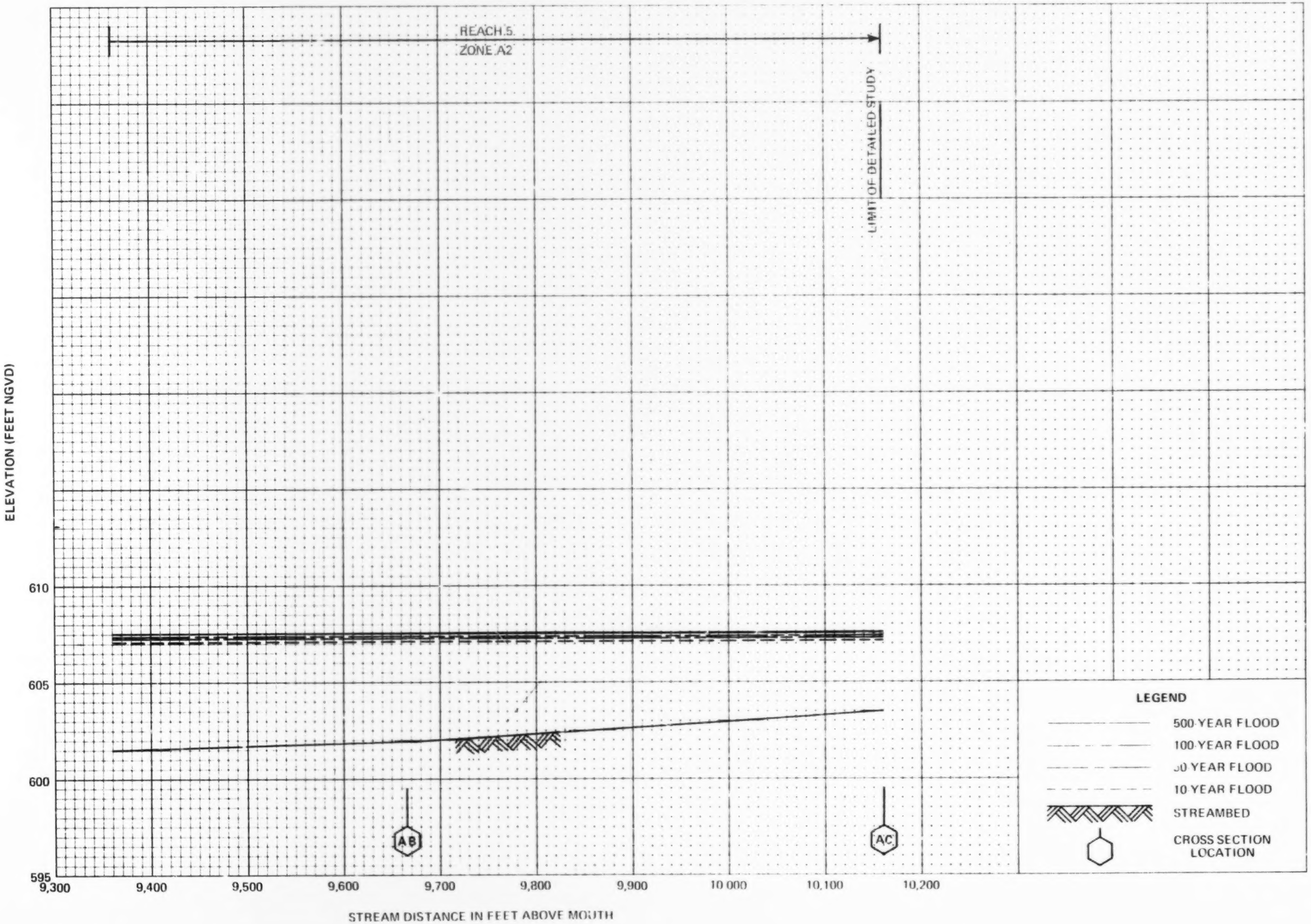
FLOOD PROFILES

RIGGS STREET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT
(NEW HAVEN CO.)

32P



FLOOD PROFILES

RIGGS STREET BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF OXFORD, CT

(NEW HAVEN CO.)

33P